

ID uzorka
38857891

Uzorkovano
24. 11. 2025.

Analizirano
24. 11. 2025.

Uzorak
Stolica

Laboratorij
labors.at

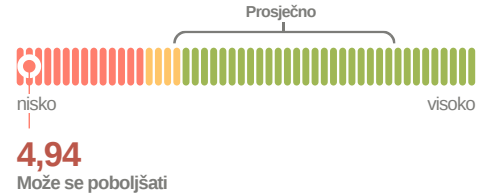
1. Zdravlje mikrobioma

Mikrobna raznolikost

Ukupna raznolikost vaših crijevnih bakterija mogla bi biti bolja. Naši savjeti pomoći će vam ojačati crijevni mikrobiom i unaprijediti vaše zdravlje.

Bogatstvo vrsta: 168 (Prosječno : 202-322)

Ujednačenost vrsta : 0,67 (Prosječno : 0,72-0,78)



📄 Dodatne informacije

Mikrobna raznolikost opisuje raznolikost vašeg crijevnog mikrobioma i sastoji se od bogatstva vrsta i ujednačenosti vrsta. Raznolikost je najvažniji parametar za analizu zdravlja vašeg crijevnog mikrobioma. Ona mjeri koliko je različitih bakterijskih vrsta (bogatstvo vrsta) prisutno u crijevima i koliko su ravnomjerno raspoređene među pojedinim vrstama (ujednačenost vrsta).

Bakterijska zajednica s visokom raznolikošću stoga se sastoji od mnogih različitih vrsta, a pojedinci su ravnomjerno raspoređeni.

Raznolikost se računa pomoću "Shannonova indeksa" – broja koji vidite u grafikonu. Ovaj indeks uzima u obzir i bogatstvo vrsta i ujednačenost (raspodjelu pojedinaca među tim vrstama). Što je vrijednost viša, to bolje!

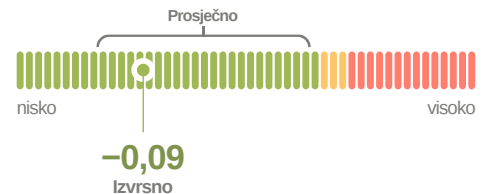
Istraživanja pokazuju da se niska raznolikost može povezati s raznim zdravstvenim problemima, poput upalne bolesti crijeva, pretilosti, metaboličkih poremećaja i autoimunih bolesti.

Bogatstvo vrsta: Pokazuje broj različitih bakterijskih vrsta u uzorku stolice. Visoka vrijednost ukazuje na veliko bogatstvo vrsta.

Ujednačenost vrsta: Daje informacije o tome koliko je uravnotežena učestalost različitih tipova bakterija u vašem crijevu. Ravnomjernija raspodjela pomaže spriječiti dominaciju nekoliko vrsta, čime bakterijska zajednica postaje manje podložna poremećajima ili nepovoljnim promjenama.

Indeks disbioze

Vaš crijevni mikrobiom je u ravnoteži. Nema dokaza o disbiozi (= neravnoteži).



📄 Dodatne informacije

Disbioza se odnosi na neravnotežu u vašem crijevnom mikrobiomu, kada potencijalno štetne bakterije brojčano nadmašuju korisne. Ova neravnoteža može biti posljedica različitih čimbenika, uključujući neuravnoteženu prehranu bogatu ultraprocesiranom hranom, životne navike poput kroničnog stresa, nedostatka tjelesne aktivnosti ili nedovoljno sna, kao i redovite upotrebe lijekova. Određena medicinska stanja, osobito upalne bolesti crijeva, također mogu povećati rizik od disbioze. Indeks disbioze kvantificira ozbiljnost ove neravnoteže i može biti koristan za praćenje promjena u mikrobiomu tijekom liječenja ili prilagodbi prehrane.

Enterotip

Enterotip 3 („Ruminococcus“) povezan je s prehranom koja je uravnotežena i bogata složenim ugljikohidratima, uključujući vlakna.



Enterotip 3: Ruminococcus

Dodatne informacije

Enterotipovi kategoriziraju crijevni mikrobiom u tri dominantne bakterijske skupine, koje čine „osnovni mikrobiom“ tijekom ranih godina života, ponajprije pod utjecajem genetskih čimbenika i prehrambenih navika. Postoje dokazi da vaš enterotip može utjecati na to koju hranu možete posebno dobro metabolizirati i koliko učinkovito se vitamini proizvode u vašem crijevu. Dugoročne prehrambene navike, zajedno s dobi, zdravstvenim stanjem i primjenom lijekova, mogu utjecati na vaš enterotip.

Imajte na umu da ova klasifikacija i vaš rezultat pokazuju samo sklonost te se tipovi mogu preklapati.

Enterotip 3

Enterotip 3 obilježen je dominacijom bakterijskog roda Ruminococcus. Ovaj enterotip osobito je čest kod osoba s miješanom prehranom. Bakterije Ruminococcus brzo i učinkovito razgrađuju neprobavljive sastojke hrane te ih pretvaraju u tvari koje pogoduju zdravlju, poput kratkolančanih masnih kiselina. Ruminococcus proizvodi više enzima koji mogu razgraditi neprobavljive ugljikohidrate, poput vlakana, i pretvoriti ih u energiju. Međutim, te bakterije mogu i oštetiti crijevnu sluznicu razgrađujući šećerno-proteinske komplekse prisutne u njoj.

Enterotip 1

Enterotip 1 („Bacteroides“) povezuje se s prehranom bogatom namirnicama životinjskog podrijetla.

Enterotip 2

Enterotip 2 („Prevotella“) povezuje se s prehranom koja se temelji na biljkama, bogatom voćem, povrćem, mahunarkama i cjelovitim žitaricama.

2. Interakcija crijevo–tijelo

Crijevno-imunološka os

Niska potpora vašem imunološkom sustavu



Vaše crijevne bakterije mogle bi biti otpornije kako bi učinkovitije podupirale vaš imunološki sustav. Naši savjeti mogu vam pomoći ojačati crijevni mikrobiom.

Dodatne informacije

Os crijevo–imunitet opisuje povezanost i interakciju između crijeva i imunološkog sustava tijela. Više od 70% imunološkog sustava nalazi se u crijevima i podupiru ga bakterije koje tamo žive. Određene bakterije aktiviraju imunološke stanice ili reguliraju njihovu aktivnost te proizvode protuupalne tvari poput kratkolančanih masnih kiselina. Zdravlje vašeg crijevnog mikrobioma ključno je za snažan imunološki sustav.

Upalni potencijal

Vaša crijeva ne pokazuju znakove upale povezane s LPS-om. Vaš upalni potencijal povezan s LPS-om je nizak.



Nizak upalni potencijal

Vaš rezultat sastoji se od 4 metabolička puta za proizvodnju LPS-a:

- Šećerni gradivni blokovi za LPS
- Prošireni LPS moduli
- Površinski antigeni
- Prekursor za LPS

□□ Dodatne informacije

Upalni potencijal u vašim crijevima može se izračunati pomoću **lipopolisaharida (LPS)**. LPS su molekule koje se nalaze u staničnim stijenkama određenih bakterija. Najnovija istraživanja pokazuju kako sastav crijevnog mikrobioma (uključujući vrste i količine bakterija koje proizvode LPS) utječe na imunološki sustav u crijevima.

Određene bakterije mogu koristiti opisane metaboličke putove za proizvodnju LPS-a. Ako u crijevima postoji previše bakterija koje proizvode LPS, povećava se potencijal za upalu.

Osim toga, indeks disbioze i snaga imuniteta važni su parametri koji mogu utjecati na upalni potencijal u crijevima.

Os crijevo–koža

Vaš crijevni mikrobiom mogao bi bolje podupirati zdravlje vaše kože. Naši savjeti mogu vam pomoći ojačati crijevne bakterije i poboljšati izgled vaše kože.

Visoka sklonost kožnim stanjima**□□ Dodatne informacije**

Os crijevo–koža opisuje povezanost između crijevnog mikrobioma i zdravlja kože. Kožne bolesti poput akni, neurodermatitisa i psorijaze često su uzrokovane upalnim procesima u tijelu, koji se zatim očituju na površini kože. Crijevne bakterije mogu izravno regulirati imunološki sustav i upalne procese u tijelu. Stoga je moguće donijeti zaključke o zdravlju kože analizom bakterija pronađenih u uzorku stolice.

Upravljanje tjelesnom težinom

Čini se da vas crijevne bakterije dobro podržavaju u prirodnoj regulaciji težine. Čini se da je sve u ravnoteži.

Niska sklonost pothranjenosti**Niska sklonost prekomjernoj tjelesnoj težini****□□ Dodatne informacije**

Sastav crijevnih bakterija utječe na različite aspekte metabolizma, poput stvaranja energije iz hrane. Nekoliko studija pokazuje da crijevne bakterije imaju ulogu u regulaciji tjelesne težine. Neke su bakterije povezane s vitkom građom, dok druge mogu pridonijeti pretilosti.

Vaša crijeva mogu sadržavati i bakterije povezane s pothranjenošću i one povezane s prekomjernom tjelesnom težinom.

Drugi važni čimbenici u regulaciji tjelesne težine uključuju mikrobnu raznolikost i kratkolančane masne kiseline koje proizvode bakterije.

3. Zdravlje crijeva**Sindrom propusnog crijeva****Visoka sklonost sindromu propusnog crijeva**

Sastav vaših crijevnih bakterija ukazuje na mogući sindrom propusnog crijeva.

Ako patite od probavnih tegoba ili simptoma, preporučujemo da se obratite liječniku.

📄 Dodatne informacije

Sindrom propusnog crijeva opisuje povećanu propusnost crijevne sluznice. Ona regulira koje tvari prolaze iz crijeva u krvotok. Ako je crijevna sluznica oštećena, neželjene tvari mogu ući u tijelo i potaknuti upalu. Za održavanje netaknute crijevne sluznice ključan je zdrav crijevni mikrobiom. Korisne crijevne bakterije pomažu u jačanju crijevne barijere i smanjenju upale. Imajte na umu da je visoka raznolikost presudna za očuvanje zdrave crijevne sluznice.

S druge strane, ako su vaše crijevne bakterije u neravnoteži, određene se bakterije mogu prekomjerno razmnožiti i pretjerano razgrađivati stanice sluznice, čineći crijevnu sluznicu još „propusnijom“. To može dovesti do sindroma propusnog crijeva. Oštećena crijevna sluznica povezuje se s povećanim rizikom od kronične upale, intolerancija na hranu, autoimunih bolesti, sindroma iritabilnog crijeva i kožnih bolesti, između ostalog.

Sindrom iritabilnog crijeva

Visoka sklonost sindromu iritabilnog crijeva



Sastav vaših crijevnih bakterija ukazuje na mogući slučaj sindroma iritabilnog crijeva. Ako patite od probavnih tegoba ili simptoma, preporučujemo da se obratite liječniku.

📄 Dodatne informacije

Sindrom iritabilnog crijeva (IBS) čest je gastrointestinalni poremećaj koji se očituje simptomima poput proljeva i/ili zatvora, nadutosti i bolova u trbuhu. Studije pokazuju da oboljeli često imaju nepovoljan sastav i manju raznolikost crijevnih bakterija u usporedbi s osobama bez IBS-a. Postoji niz uzroka koji mogu potaknuti sindrom iritabilnog crijeva ili pogoršati simptome. Čini se da psihološki čimbenici, poput stresa, imaju osobito važnu ulogu. Osim toga, pothranjenost, nedostatak nutrijenata, druge bolesti, toksini, manjak želučane kiseline, lijekovi, infekcije i neravnoteža u crijevnom mikrobiomu ubrajaju se među moguće okidače.

SIBO

Niska sklonost SIBO-u



Čini se da ne postoji povezanost između vaših crijevnih bakterija i mogućeg prekomjernog rasta bakterija u tankom crijevu.

📄 Dodatne informacije

SIBO (prekomjerni rast bakterija u tankom crijevu) označava stanje u kojem dolazi do pretjeranog umnažanja bakterija u tankom crijevu. Uobičajeno, tanko crijevo sadrži znatno manje bakterija nego debelo crijevo. Kod SIBO-a, međutim, povećava se prisutnost bakterija iz debelog crijeva u tankom crijevu. To se najčešće događa zbog usporene probave ili anatomskih promjena nakon operacije. Najčešći simptom je nadutost, no mogu se javiti i drugi probavni poremećaji te nedostatak hranjivih tvari (posebno vitamina B12).

Istraživanja pokazuju da prekomjerni rast bakterija u tankom crijevu također utječe na sastav bakterija u debelom crijevu. Uzorak stolice stoga može dati naznake o mogućoj prisutnosti SIBO-a. Ako je nalaz pozitivan, preporučuje se konzultirati liječnika i napraviti dodatni test daha.

Osjetljivost na gluten

Visoka sklonost osjetljivosti na gluten



Sastav vašeg crijevnog mikrobioma ukazuje na moguću osjetljivost na gluten. Ako patite od probavnih tegoba ili simptoma, preporučujemo da se obratite liječniku.

📄 Dodatne informacije

Osjetljivost na gluten odnosi se na reakciju na gluten koja nije povezana s celijakijom (autoimunim odgovorom) ili alergijom na pšenicu. Gluten je protein koji se nalazi u žitaricama poput pšenice, pira, raži i ječma. Njegova konzumacija kod osoba s osjetljivošću na gluten može dovesti do probavnih smetnji i simptoma poput kroničnog umora i glavobolja.

Na temelju znanstvenih studija danas je moguće uspostaviti poveznicu između sastava crijevnog mikrobioma i potencijalne osjetljivosti na gluten.

4. Popisi bakterija

Omjer F/B

Vaš omjer F/B: 4,78

Referenca (%)

1,08 - 2,03

Bakterija	Učestalost (%)	Referenca (%)
Bacteroidota	↓ 16,81	30,88 - 45,11
Firmicutes	↑ 80,37	48,28 - 63,47

Probiotičke bakterije

Bakterija	Učestalost (%)	Referenca (%)
Akkermansia muciniphila	0,82	0,00 - 1,56
Bifidobacterium	0,23	0,03 - 0,66
Bifidobacterium longum	0,23	0,00 - 0,36
Lactobacillus	0,00	0,00 - 0,01

Bakterije koje proizvode mucin

Bakterija	Učestalost (%)	Referenca (%)
Akkermansia muciniphila	0,82	0,00 - 1,56
Bacteroides fragilis	0,00	0,00 - 0,26
Bacteroides thetaiotaomicron	↓ 0,00	0,02 - 0,65
Bifidobacterium	0,23	0,03 - 0,66
Faecalibacterium prausnitzii	10,36	3,44 - 11,31
Lactobacillus	0,00	0,00 - 0,01

Bakterije koje proizvode butirat

Bakterija	Učestalost (%)	Referenca (%)
Anaerostipes	0,10	0,04 - 0,36
Coprococcus	↓ 0,00	0,06 - 1,90
Eubacterium hallii group	0,01	0,00 - 0,09
Faecalibacterium prausnitzii	10,36	3,44 - 11,31
Roseburia	0,15	0,00 - 0,16
Subdoligranulum	↓ 0,00	0,30 - 2,50

Bakterije koje reduciraju sulfat

Bakterija	Učestalost (%)	Referenca (%)
Bilophila	↓ 0,00	0,02 - 0,25
Bilophila wadsworthia	0,00	0,00 - 0,24
Desulfovibrio	0,00	0,00 - 0,23

Pregled svih bakterija

Koljeno	Rod	Učestalost (%)	Referenca (%)
Firmicutes	Agathobacter	0,07	Nema podataka
Verrucomicrobiota	Akkermansia	0,82	0,00 - 1,94
Bacteroidota	Alistipes	1,86	1,35 - 4,96
Firmicutes	Anaerofilum	0,00	0,00 - 0,01
Firmicutes	Anaerostipes	0,10	0,04 - 0,36
Firmicutes	Anaerotruncus	0,00	0,00 - 0,01
Bacteroidota	Bacteroides	13,40	11,89 - 31,62
Bacteroidota	Barnesiella	0,73	0,13 - 2,04
Actinobacteriota	Bifidobacterium	0,23	0,03 - 0,66
Desulfobacterota	Bilophila	↓ 0,00	0,02 - 0,25
Firmicutes	Blautia	0,00	0,00 - 0,16
Firmicutes	Butyricoccus	0,15	0,11 - 0,47
Bacteroidota	Butyricimonas	0,00	0,00 - 0,22
Firmicutes	CAG-352	1,29	Nema podataka
Firmicutes	CAG-56	0,00	0,00 - 0,12

Koljeno	Rod	Učestalost (%)	Referenca (%)
Firmicutes	Candidatus Soleaferrea	0,01	Nema podataka
Firmicutes	Christensenellaceae R-7 group	0,19	0,05 - 1,83
Firmicutes	Clostridium sensu stricto 1	0,02	0,00 - 0,11
Firmicutes	Colidextribacter	0,07	0,05 - 0,19
Actinobacteriota	Collinsella	0,08	0,02 - 0,22
Bacteroidota	Coprobacter	0,21	0,00 - 0,24
Firmicutes	Coprococcus	↓ 0,00	0,06 - 1,90
Firmicutes	Defluviitaleaceae UCG-011	0,01	0,00 - 0,03
Desulfobacterota	Desulfovibrio	0,00	0,00 - 0,23
Firmicutes	Dialister	0,14	0,00 - 2,50
Firmicutes	Dielma	0,00	0,00 - 0,01
Firmicutes	DTU089	0,01	0,00 - 0,02
Firmicutes	Eisenbergiella	↑ 0,11	0,00 - 0,02
Actinobacteriota	Enterorhabdus	0,00	0,00 - 0,01
Firmicutes	Erysipelatoclostridium	0,00	0,00 - 0,05
Firmicutes	Erysipelotrichaceae UCG-003	0,20	0,03 - 0,33
Proteobacteria	Escherichia-Shigella	0,00	0,00 - 0,07
Firmicutes	Eubacterium eligens group	↑ 6,15	0,25 - 2,68
Firmicutes	Eubacterium hallii group	0,01	0,00 - 0,09
Firmicutes	Eubacterium nodatum group	0,00	0,00 - 0,02
Firmicutes	Eubacterium oxidoreducens group	0,00	0,00 - 0,05
Firmicutes	Eubacterium ruminantium group	0,00	0,00 - 0,13
Firmicutes	Eubacterium siraeum group	↑ 11,54	0,01 - 1,49
Firmicutes	Eubacterium ventriosum group	0,07	0,01 - 0,15
Firmicutes	Eubacterium xylanophilum group	0,25	0,00 - 0,37
Firmicutes	Faecalibacterium	↑ 30,04	6,02 - 15,78
Firmicutes	Family XIII AD3011 group	0,00	0,00 - 0,08
Firmicutes	Family XIII UCG-001	0,00	0,00 - 0,03
Firmicutes	Flavonifractor	↑ 0,10	0,00 - 0,06
Firmicutes	Fournierella	0,00	0,00 - 0,01

Koljeno	Rod	Učestalost (%)	Referenca (%)
Firmicutes	Fringingococcus	0,01	Nema podataka
Firmicutes	GCA-900066575	↓ 0,00	0,01 - 0,08
Proteobacteria	Haemophilus	↑ 0,38	0,00 - 0,12
Firmicutes	Holdemanela	0,00	0,00 - 0,09
Firmicutes	Holdemania	0,03	0,00 - 0,05
Firmicutes	Hydrogenoanaerobacterium	0,00	0,00 - 0,01
Firmicutes	Intestinibacter	0,00	0,00 - 0,03
Firmicutes	Intestinimonas	0,01	0,00 - 0,06
Firmicutes	Lachnoclostridium	0,21	0,15 - 0,82
Firmicutes	Lachnospira	↓ 0,00	0,35 - 2,63
Firmicutes	Lachnospiraceae FCS020 group	↓ 0,01	0,03 - 0,37
Firmicutes	Lachnospiraceae NC2004 group	↓ 0,00	0,02 - 1,00
Firmicutes	Lachnospiraceae ND3007 group	↓ 0,00	0,24 - 2,58
Firmicutes	Lachnospiraceae NK4A136 group	↑ 1,13	0,00 - 0,28
Firmicutes	Lachnospiraceae UCG-001	↓ 0,00	0,02 - 0,51
Firmicutes	Lachnospiraceae UCG-004	0,00	0,00 - 0,29
Firmicutes	Lachnospiraceae UCG-008	0,00	0,00 - 0,05
Firmicutes	Lachnospiraceae UCG-010	0,03	0,03 - 0,27
Firmicutes	Lactobacillus	0,00	0,00 - 0,01
Firmicutes	Lactococcus	0,00	0,00 - 0,01
Firmicutes	Marvinbryantia	0,00	0,00 - 0,02
Firmicutes	Merdibacter	0,00	0,00 - 0,01
Firmicutes	Monoglobus	↓ 0,06	0,07 - 0,37
Firmicutes	Moryella	0,00	0,00 - 0,05
Firmicutes	Negativibacillus	0,08	0,00 - 0,08
Firmicutes	NK4A214 group	0,03	0,00 - 0,95
Bacteroidota	Odoribacter	0,17	0,11 - 0,41
Firmicutes	Oscillibacter	0,10	0,03 - 0,31
Firmicutes	Oscillospira	0,00	0,00 - 0,11
Proteobacteria	Oxalobacter	0,00	0,00 - 0,03

Koljeno	Rod	Učestalost (%)	Referenca (%)
Bacteroidota	Parabacteroides	↓ 0,45	0,94 - 3,59
Bacteroidota	Paraprevotella	0,00	0,00 - 0,36
Proteobacteria	Parasutterella	0,69	0,01 - 0,80
Firmicutes	Peptococcus	0,00	0,00 - 0,03
Firmicutes	Phascolarctobacterium	1,25	0,00 - 2,07
Firmicutes	Phocea	0,00	0,00 - 0,01
Bacteroidota	Prevotella	0,00	0,00 - 11,55
Firmicutes	Pseudoflavonifractor	0,01	0,00 - 0,01
Firmicutes	Romboutsia	0,00	0,00 - 0,01
Firmicutes	Roseburia	0,15	0,00 - 0,16
Firmicutes	Ruminococcus	0,36	0,15 - 1,95
Firmicutes	Ruminococcus torques group	0,00	0,00 - 0,11
Actinobacteriota	Senegalimassilia	0,00	0,00 - 0,02
Actinobacteriota	Slackia	0,00	0,00 - 0,02
Firmicutes	Streptococcus	↑ 0,95	0,03 - 0,31
Firmicutes	Subdoligranulum	↓ 0,00	0,30 - 2,50
Proteobacteria	Sutterella	↓ 0,00	0,02 - 2,45
Firmicutes	Terrisporobacter	0,00	0,00 - 0,02
Patescibacteria	TM7x	0,01	0,00 - 0,03
Firmicutes	Turicibacter	↑ 0,07	0,00 - 0,06
Firmicutes	Tyzzereella	0,00	0,00 - 0,11
Firmicutes	UBA1819	0,03	0,00 - 0,05
Firmicutes	UCG-002	0,23	0,03 - 0,63
Firmicutes	UCG-003	0,00	0,00 - 0,18
Firmicutes	UCG-005	↓ 0,00	0,02 - 0,54
Firmicutes	UCG-009	0,00	0,00 - 0,01
Firmicutes	Veillonella	↑ 0,16	0,00 - 0,15
Verrucomicrobiota	Victivallis	0,14	0,00 - 0,24

5. Preporuke

Mikrobno zdravlje

Izbjegavajte šećer i zaslađivače

Visoka konzumacija šećera i umjetnih sladila može imati negativne učinke na crijevni mikrobiom i oštetiti rast korisnih bakterija. Kako vaš mikrobiom pokazuje znakove neravnoteže, važno je smanjiti konzumaciju šećera i dati prednost prirodnim sladilima. Smanjenjem unosa šećera možete stvoriti okruženje koje bolje podržava dobre bakterije u vašim crijevima. Počnite postupno prilagođavati svoju prehranu kako biste smanjili konzumaciju slatke hrane i pića te se umjesto toga usredotočite na cjelovite namirnice i prirodna sladila.

Nutritivna raznolikost

Raznolika prehrana na biljnoj bazi poboljšava crijevni mikrobiom osiguravajući jedinstvena vlakna i hranjive tvari koje podržavaju korisne bakterije. Redovito u prehranu uključujte šareno voće, povrće, žitarice i mahunarke kako biste poboljšali zdravlje i otpornost svog mikrobioma.

Enterotip 3 – dominantno Ruminococcus

Enterotip 3 povezan je s uravnoteženom prehranom koja uključuje i životinjsku i biljnu hranu. Vrste Ruminococcus mogu učinkovito razgraditi rezistentni škrob, pa je uključivanje ovih škrobova posebno korisno za zdravlje crijeva. Raznolika prehrana s dovoljno proteina igra središnju ulogu u održavanju ovog enterotipa.

Odaberite zdravije alternative dodanom šećeru:

- Svježe voće: Birajte slatke voćne grickalice umjesto slatkih poslastica.
- Med i javorov sirup: Koristite ove prirodne zaslađivače umjereno.
- Tamna čokolada: Uživajte u malom komadu kao desert ako sadrži malo šećera.
- Nezaslađeni (biljni) jogurt: Odaberite ga kao probiotičku bazu i dodajte voće za okus.

Svakodnevno konzumirajte raznovrsnu biljnu hranu:

- Crveni kupus: Dodajte ga u pržena jela, pecite ga u pećnici ili ga fermentirajte kao prilog uz proteinsko jelo.
- Crveni ribiz: Uživajte ih sirove kao međuobrok, u desertima ili ih dodajte u salate.
- Slatki krumpir: Pecite ga ili zgnječite za slani prilog.
- Bobičasto voće: Pomiješajte ih u smoothieje ili jogurt.

Ojačajte svoj mikrobiom uključivanjem rezistentnog škroba i raznih izvora proteina:

- Otporni škrob: Redovito uključujte ohlađeni krumpir, rižu i mahunarke u svoje obroke. Otporni škrob se također nalazi u indijskim oraščićima, sirovoj zobi i blago zrelim bananama.
- Kombinirajte biljne proteine: Miješajte i kombinirajte proteine za optimalno iskorištavanje proteina. Na primjer: grah s kukuruzom, leća dal sa smeđom rižom, humus s kruhom od cjelovitih žitarica.
- Zdrave masti i dovoljna količina tekućine: Konzumirajte zdrave masti poput maslinovog ulja, sezama i avokada. Pijte puno vode kako biste spriječili zatvor, čest problem kod ovog enterotipa.

🏠 Juha od brokule i leće

Sastojci:

- 1 glavica brokule, nasjeckana
- 1 šalica crvene leće
- 1 luk, nasjeckan na kockice
- 2 češnja češnjaka, nasjeckana
- 6 šalica povrtnog temeljca
- 1 žlica maslinovog ulja
- 1 čajna žličica sušenog timijana
- Sol i papar po ukusu
- Kriške limuna za posluživanje

Priprema:

- Zagrijte maslinovo ulje u velikoj tavi na srednjoj vatri.
- Dodajte luk i češnjak i pržite dok ne omekšaju.
- Dodajte brokulu, leću i timijan te dobro promiješajte.
- Ulijte povrtni temeljac i sve zakuhajte.
- Smanjite vatru i pirjajte poklopljeno 20-25 minuta dok leća ne omekša.
- Juhu izmiksajte štapićnim mikserom.
- Začinite solju i paprom.
- Poslužite vruće s kriškom limuna.

Ova hranjiva i utješna juha od brokule, bogata proteinima i vlaknima, ugrijać će vas iznutra.

Interakcija crijeva i tijela

Dajte prednost omega-3 masnim kiselinama

Omega-3 masne kiseline podržavaju zdravlje crijeva povećanjem količine bakterija koje proizvode butirat i bitne su za zdravlje kože.

Jedite hranu bogatu omega-3 masnim kiselinama barem 3 puta tjedno:

- Masna riba (divlji losos, skuša, sardine, riblje ulje)
- Ulje algi
- Lanene, chia i konopljine sjemenke
- Orasi i edamame

Zdravije proteinske opcije

Umjesto prerađenog mesa, birajte zdravije alternative koje su ukusne i nude zdravstvene prednosti.

Isprobajte ove ukusne opcije:

- Dimljeni losos: Ukusna alternativa bogata omega-3 masnim kiselinama koja se dobro slaže s raznim jelima.
- Nemasna perad: Odaberite tanko narezanu, nemasnu puretinu ili piletinu za izvor proteina s niskim udjelom masti koji je svestran i zasitan.
- Kriške tofua: Uživajte u tanko narezanom tofuu začinjenom solju i začinskim biljem ili mariniranom u soja umaku i kratko poprženom za dodatni okus i teksturu. Također je odličan na kruhu umjesto na kobasici.

Ograničite konzumaciju čokolade

Čak i tamna čokolada s preko 70% udjela kakaa može pogoršati akne.

Pazite na konzumaciju čokolade za čišću kožu:

- Ograničite konzumaciju čokolade na 2-3 puta tjedno.
- Razmislite o potpunom izbacivanju čokolade iz prehrane na dva tjedna i obratite pozornost na sve promjene na koži.

🏠 Miso juha s tofuom i povrćem

Sastojci:

- 4 šalice vode
- 3 žlice miso paste
- 1 blok čvrstog tofua, nasjeckanog na kockice
- 1 šalica narezanih gljiva
- 1 šalica narezanog bok choya
- 1/4 šalice nasjeckanog mladog luka
- 2 žlice soja sosa

Priprema:

- Lagano zakuhajte vodu.
- Dodajte narezane gljive i bok choy te pirajte 5 minuta.
- Dodajte nasjeckani tofu i pirajte još 3 minute dok se potpuno ne zagrije.
- Ugasite vatru i lagano umiješajte miso pastu i soja sos.
- Pospite mladim lukom i poslužite vruće.

Topla, krepka juha s probioticima i zdravim povrćem.

Zdravlje crijeva

Ograničite alkohol i kofein

Alkohol i kofein mogu iritirati sluznicu crijeva i poremetiti osjetljivu ravnotežu vašeg mikrobioma. Smanjenje unosa ovih tvari može pomoći u smanjenju upale i potaknuti zacjeljivanje u crijevima. Njihovo ograničavanje može pomoći u upravljanju probavnim smetnjama i upalnim simptomima, omogućujući crijevnoj barijeri da se pravilno oporavi. Jasno razumijevanje kako ove tvari utječu na vašu probavu ključno je za donošenje informiranih odluka koje daju prioritet zdravlju crijeva. Zamjena alkoholnih pića i kofeina umirujućim biljnim čajevima može pomoći u održavanju hidratacije i držanju simptoma pod kontrolom, a istovremeno pruža smirujući učinak na vašu crijeva.

Smanjite zasićene masti

Prekomjerna konzumacija zasićenih masnih kiselina može povećati brojnost Oscillospiraceae, koje su negativno povezane s proizvodnjom zonulina-1 (proteina koji tvori crijevnu barijeru).

Isprobajte ove alternative za piće:

- Biljni čajevi: Isprobajte verzije bez kofeina poput kamilice ili rooibosa za opuštanje i pomoć probavi.
- Kokosova voda: Razmislite o kokosovoj vodi kao osvježavajućoj alternativi tijekom vrućih dana.
- Mocktails: Uživajte u bezalkoholnim mocktailsima sa svježim sokovima i gaziranom vodom za svečani dodir.
- Napitci: Pijuckajte tople napitke za utjehu i kao alternativu napitcima s kofeinom.

Smanjite unos zasićenih masti uz pomoć ovih savjeta:

- Birajte nemasno meso umjesto prerađenih mesnih proizvoda i kobasica.
- Provjerite nutritivne informacije na pakiranju hrane i birajte proizvode s nižim udjelom zasićenih masti.
- Zamijenite zasićene masti zdravim mastima iz orašastih plodova, sjemenki, avokada i ribe.

Uravnotežite crijevne bakterije

Održavanje zdrave ravnoteže crijevnih bakterija ključno je, posebno za one koji su u riziku od probavnih problema poput sindroma iritabilnog crijeva. Neravnoteža, posebno smanjenje bakterija poput Bacteroidetes i Firmicutes, može negativno utjecati na funkciju crijeva. Poticanje ovih korisnih bakterija može pomoći u promicanju cjelokupnog zdravlja probavnog sustava i ublažavanju simptoma.

Načini za povećanje broja Bacteroidetes i Firmicutes:

- **Redovita tjeleježba:** Vježbajte ili se bavite sportom barem 30 minuta svaki dan kako biste podržali zdravlje crijeva.
- **Meditranska prehrana:** Uključite obroke u skladu s mediteranskom prehranom nekoliko puta tjedno. Ova prehrana uključuje raznovrsno povrće, voće, mahunarke, cjelovite žitarice, visokokvalitetno maslinovo ulje i ribu. Primjeri uključuju mediteransku salatu od graha, punjene paprike i vegansku/vegetarijansku grčku salatu s maslinama.
- **Ugljikohidrati bogati vlaknima:** Pokušajte osigurati da barem polovica vaših ugljikohidrata dolazi iz izvora bogatih vlaknima poput smeđe riže, tjestenine od cjelovitih žitarica i mahunarki.
- **Omega-3 masne kiseline:** Uključite izvore omega-3 masnih kiselina poput chia sjemenki, konoplje i lana ili ulja algi kako biste podržali zdravlje crijeva.

🍷 Energetske pločice s orašastim plodovima i voćem

Sastojci:

1/2 šalice miješanih orašastih plodova
1/2 šalice datulja
1/2 šalice suhih marelica
1 žlica chia sjemenki

Priprema:

1. U multipraktiku pomiješajte bademe, chia sjemenke, datulje i suhe marelice. Miksajte dok se sve fino ne nasjecka i smjesa ne počne čvrsto držati.
2. Utisnite u četvrtasti kalup za pečenje obložen papirom za pečenje.
3. Ohladite u hladnjaku 1-2 sata.
4. Narežite na štangice i poslužite.

Idealno za podizanje energije između obroka ili kao zdrav međuobrok u pokretu.

Sažetak

Evo brzog pregleda načina za poboljšanje zdravlja crijeva:

- **Smanjite dodane šećere i umjetna sladila:** Visoki unos dodanih šećera i umjetnih sladila može negativno utjecati na vaš crijevni mikrobiom i ometati korisne bakterije. Smanjenje unosa šećera stvara okruženje koje podržava dobre crijevne bakterije, što je posebno važno s obzirom na trenutnu neravnotežu vašeg mikrobioma. Postupno prilagodite svoju prehranu kako biste smanjili slatke namirnice i pića, umjesto toga birajte cjelovite namirnice i prirodna sladila.
- **Prihvatite raznoliku biljnu prehranu:** Raznolika, biljna prehrana poboljšava vaš crijevni mikrobiom pružajući jedinstvena vlakna i hranjive tvari koje podržavaju korisne bakterije. Stalno uključujte šareno voće, povrće, žitarice i mahunarke kako biste poboljšali zdravlje i otpornost mikrobioma. Ovaj pristup je ključan za njegovanje korisnih bakterija u vašem crijevu.
- **Podržite enterotip 3 uravnoteženom prehranom:** Enterotip 3 uspijeva na mješovitoj prehrani, uključujući i životinjske i biljne namirnice. Vrste Ruminococcus, koje su učinkovite u razgradnji rezistentnog škroba, važne su u ovom enterotipu. Stoga je uključivanje rezistentnih škroba korisno za vaše crijeva. Dobro uravnotežena prehrana, kombinirajući biljne i životinjske proteine, ključna je za podršku ovom enterotipu i održavanje zdravlja crijeva.
- **Ograničite unos alkohola i kofeina:** Alkohol i kofein mogu iritirati sluznicu crijeva i poremetiti osjetljivu ravnotežu vašeg mikrobioma. Smanjenje unosa može pomoći u smanjenju upale i potaknuti zacjeljivanje, što je bitno s obzirom na vaše trenutne probleme s crijevima. Ograničavanje ovih tvari može upravljati simptomima probavnih smetnji i upale, omogućujući vašoj crijevnoj barijeri da se oporavi. Zamjena alkoholnih pića i kofeina umirujućim biljnim čajevima može pomoći u održavanju hidratacije i smirivanju vaših crijeva.
- **Izbjegavajte prekomjerne zasićene masti:** Prekomjerna konzumacija zasićenih masnih kiselina može povećati prisutnost Oscillospiraceae, koje su negativno povezane s proizvodnjom zonulina-1, proteina ključnog za održavanje crijevne barijere. To može doprinijeti problemima poput propusnih crijeva. Smanjenje unosa zasićenih masti može pomoći u zaštiti vaše crijevne barijere i promicanju cjelokupnog zdravlja crijeva.
- **Potaknite korisne bakterije:** Održavanje zdrave ravnoteže crijevnih bakterija ključno je, posebno kada se suočavate s probavnim problemima poput IBS-a. Neravnoteža, posebno smanjenje korisnih bakterija poput Bacteroidetes i Firmicutes, može negativno utjecati na funkciju crijeva. Poticanje ovih korisnih bakterija može pomoći u promicanju cjelokupnog probavnog zdravlja i ublažavanju simptoma, što je vitalno za vaše trenutno stanje.

- **Povećajte unos omega-3 masnih kiselina:** Omega-3 masne kiseline vitalne su za zdravlje crijeva, jer povećavaju prisutnost bakterija koje proizvode butirat, a koje igraju ključnu ulogu u održavanju zdravog crijeva. Također su bitne za zdravlje kože, što je posebno relevantno s obzirom na vašu abnormalnu korelaciju sa zdravljem kože. Uključivanje više omega-3 u vašu prehranu može pomoći u poboljšanju zdravlja crijeva i kože.
- **Odaberite zdravije izvore proteina:** Umjesto prerađenog mesa, odlučite se za zdravije alternative koje pružaju odličan okus i nutritivne prednosti. To je u skladu s podržavanjem vašeg enterotipa 3, koji ima koristi od uravnoteženog unosa biljnih i životinjskih proteina. Ove promjene mogu doprinijeti boljem zdravlju crijeva i općem blagostanju.
- **Oprez sa čokoladom i aknama:** Čak i tamna čokolada s preko 70% udjela kakaa može pogoršati akne. S obzirom na vašu abnormalnu korelaciju s aknama i zdravljem kože, važno je obratiti pažnju na unos čokolade, posebno ako primijetite pogoršanje stanja kože nakon konzumacije. Razmislite o smanjenju ili eliminaciji čokolade kako biste uočili poboljšanja.

6. O nama

Analiza, kontinuiranim ulaganjem i praćenjem laboratorijske dijagnostike, postavlja nove standarde zdravstvene skrbi i prevencije za svoje klijente s ciljem očuvanja zdravlja i povećanja kvalitete života.

Analiza je dijagnostički zdravstveni centar specijaliziran za laboratorijske usluge. Sveobuhvatnost testiranja, inovativne usluge, uključivanje liječnika specijalista nakon laboratorijske dijagnostike i teritorijalna distribucija poslovnih jedinica osnovne su karakteristike ove ustanove.

Analiza posluje od 2001. godine, a dugogodišnja tradicija pružanja visokokvalitetnih usluga izdvaja Analizu kao jednog od lidera u segmentu privatnog zdravstva, što potvrđuje preko 150 000 pacijenata u 2021. godini. Zaposleno je 75 ljudi, uključujući 7 specijalista medicinske biokemije, 1 magistra medicinske biokemije, 8 liječnika specijalista, od kojih su 3 profesora, farmaceuta, nutricionista, 4 molekularna biologa, 26 viših i srednjih laboratorijskih tehničara, 8 medicinskih sestara i ostalog nemedicinskog osoblja, te surađuje s nizom specijalista iz područja medicine, farmacije i biotehnologije.

Suradnjom s europskim i američkim laboratorijima omogućujemo pacijentima dostupnost visoko inovativnih dijagnostičkih testova na tržištu u Hrvatskoj. Uz veliki broj biokemijskih, imunokemijskih, seroloških i mikrobioloških testova, u Analizi možete napraviti specijalne testove kao što su:

- testiranje na alergije
- test intolerancije na hranu
- tekuće biopsije
- analiza minerala i teških metala iz kose
- test za određivanje metaboličkih bolesti kod djece
- genetski testovi
- test očinstva i skrbništva

Specijalni testovi omogućuju našim pacijentima analizu informacija o njihovom zdravstvenom stanju koje do sada nisu mogli dobiti, što može biti prekretnica u dijagnostici i planiranju liječenja.

Naša je vizija postati lider u segmentu laboratorijske dijagnostike putem mreže vlastitih zdravstvenih centara.

Napomena

Otkrivanje mikroorganizma ovim testom ne znači nužno prisutnost bolesti. Isto tako, neotkrivanje mikroorganizma ovim testom ne isključuje prisutnost mikroorganizma koji može uzrokovati bolest. Mogu biti prisutni i drugi mikroorganizmi koje ovaj test ne detektira. Ovaj test nije zamjena za utvrđene metode identifikacije mikroorganizama ili za određivanje njihovog profila osjetljivosti na antimikrobne lijekove.

Analizirani podaci ispituju se pomoću specifičnih algoritama za filogenetsku analizu kako bi se dobili precizni rezultati na temelju kojih se izrađuje vaše izvješće o mikrobiomu. Za to se koriste najnovija znanstvena saznanja, bioinformatička izvrsnost i algoritmi uz potporu umjetne inteligencije. Ovi algoritmi strojnog učenja koriste se, uz najviše standarde privatnosti i sigurnosti podataka, u poglavljima o zdravlju crijeva i interakciji crijevo–tijelo (isključujući upalne potencijale) kako bi se utvrdila sklonost profila mikrobioma uzorka prema profilima uzoraka osoba sa specifičnim obilježjima. Sažetak u poglavlju „Preporuke“ izrađen je uz pomoć umjetne inteligencije.

Ne preuzimamo odgovornost za zdravstvene odluke donesene na temelju rezultata testa.

Reference

- [1] Human Microbiome Project Consortium. A framework for human gut microbiota. *Nature*. 2012.
- [2] Human Microbiome Project Consortium. Structure, function and diversity of the healthy human microbiome. *Nature*. 2012.
- [3] Lozupone CA, et al. Diversity, stability and resilience of the human gut microbiota. *Nature*. 2012.
- [4] Yatsunenko T, et al. Human gut microbiome viewed across age and geography. *Nature*. 2012.
- [5] Langille MG, et al. Predictive functional profiling of microbial communities using 16S rRNA marker gene sequences. *Nat Biotechnol*. 2013.
- [6] Ranjan R, et al. Multiomic strategies reveal diversity and important functional aspects of human gut microbiome. *Biomed Res Int*. 2018.
- [7] King CH, et al. Baseline human gut microbiota profile in healthy people and standard reporting template. *PLoS ONE*. 2019.
- [8] Martinez-Guiryn M, et al. Regional diversity of the gastrointestinal microbiome. *Cell Host Microbe*. 2019.
- [9] Young VB, et al. Overview of the gastrointestinal microbiota. *Adv Exp Med Biol*. 2008.
- [10] Chatelier E, et al. Richness of human gut microbiome correlates with metabolic markers. *Nature*. 2013.
- [11] Cotillard A, et al. Dietary intervention impact on gut microbial gene richness. *Nature*. 2013.
- [12] Li J, et al. An integrated catalog of reference genes in the human gut microbiome. *Nat Biotechnol*. 2014.
- [13] Donaldson GP, et al. Gut biogeography of the bacterial microbiota. *Nat Rev Microbiol*. 2015.
- [14] Pasoli E, et al. Extensive unexplored human microbiome diversity revealed by over 150,000 genomes from metagenomes spanning age, geography, and lifestyle. *Cell*. 2019.
- [15] Hagerly SL, et al. An empirically derived method for measuring human gut microbiome alpha diversity: Demonstrated utility in predicting health-related outcomes among a human clinical sample. *PLoS One*. 2020.
- [16] Manor O, et al. Health and disease markers correlate with gut microbiome composition across thousands of people. *Nat Commun*. 2020.
- [17] Kers JG, et al. The power of microbiome studies: Some considerations on which alpha and beta metrics to use and how to report results. *Front Microbiol*. 2022.
- [18] Gevers D, et al. The treatment-naïve microbiome in new-onset Crohn's disease. *Cell Host Microbe*. 2014.
- [19] Casén C, et al. Deviations in human gut microbiota: a novel diagnostic test for determining dysbiosis in patients with IBS or IBD. *Aliment Pharmacol Ther*. 2015.
- [20] Wang J, et al. Gut microbial dysbiosis is associated with altered hepatic functions and serum metabolites in chronic hepatitis B patients. *Front Microbiol*. 2017.
- [21] Farup PG, et al. Separating "good" from "bad" faecal dysbiosis—evidence from two cross-sectional studies. *BMC Obes*. 2018.
- [22] Váleur J, et al. Exploring gut microbiota composition as an indicator of clinical response to dietary FODMAP restriction in patients with irritable bowel syndrome. *Dig Dis Sci*. 2018.
- [23] Wei S, et al. Determining gut microbial dysbiosis: a review of applied indexes for assessment of intestinal microbiota imbalances. *Appl Environ Microbiol*. 2021.
- [24] Malinen E, et al. Association of symptoms with gastrointestinal microbiota in irritable bowel syndrome. *World J Gastroenterol*. 2010.
- [25] Arumugam M, et al. Enterotypes of the human gut microbiome. *Nature*. 2011.
- [26] Wu GD, et al. Linking long-term dietary patterns with gut microbial enterotypes. *Science*. 2011.
- [27] Koren O, et al. A guide to enterotypes across the human body: meta-analysis of microbial community structures in human microbiome datasets. *PLoS Comput Biol*. 2013.
- [28] Ley RE, et al. Gut microbiota in 2015: Prevotella in the gut: choose carefully. *Nat Rev Gastroenterol Hepatol*. 2016.
- [29] Mobeen F, et al. Enterotype variations of the healthy human gut microbiome in different geographical regions. *Bioinformatics*. 2018.
- [30] Heeney DD, et al. Intestinal Lactobacillus in health and disease, a driver or just along for the ride? *Curr Opin Biotechnol*. 2018.
- [31] Costea PI, et al. Enterotypes in the landscape of gut microbial community composition. *Nat Microbiol*. 2018.
- [32] Naumova N, et al. Human gut microbiome response to short-term Bifidobacterium-based probiotic treatment. *Indian J Microbiol*. 2020.
- [33] Markowiak-Kopec P, et al. The effect of probiotics on the production of short-chain fatty acids by human intestinal microbiome. *Nutrients*. 2020.
- [34] Bulgin I, et al. Absence of enterotypes in the human gut microbiomes reanalyzed with non-linear dimensionality reduction methods. *PeerJ*. 2023.
- [35] Zheng D, et al. Interaction between microbiota and immunity in health and disease. *Cell Research*. 2020.
- [36] Robinson I, et al. Assessing the performance of a novel stool-based microbiome test that predicts response to first line immune checkpoint inhibitors in multiple cancer types. *MDPI Cancers*. 2023.
- [37] Di Lorenzo F, et al. Lipopolysaccharide structure of Gram-negative populations in the gut microbiota and effects on host interactions. *FEMS Microbiol Rev*. 2019.
- [38] Kaczmarczyk M, et al. The gut microbiota is associated with the small intestinal paracellular permeability and the development of the immune system in healthy children during the first two years of life. *J Transl Med*. 2021.
- [39] Si J, et al. Gut microbiome signatures distinguish type 2 diabetes mellitus from non-alcoholic fatty liver disease. *Comput Struct Biotechnol J*. 2021.
- [40] Qin Q, et al. The relationship between osteoporosis and intestinal microbes in the Henan Province of China. *Front Cell Dev Biol*. 2021.
- [41] Ghosh SS, et al. Intestinal barrier dysfunction, LPS translocation, and disease development. *J Endocr Soc*. 2022.
- [42] Khorsand B, et al. Overrepresentation of Enterobacteriaceae and Escherichia coli is the major gut microbiome signature in Crohn's disease and ulcerative colitis; a comprehensive metagenomic analysis of IBDMDB datasets. *Front Cell Infect Microbiol*. 2022.
- [43] Nzaburashimana E, et al. Functional profile of host microbiome indicates Clostridioides difficile infection. *Gut Microbes*. 2022.
- [44] Peng YC, et al. Gut microbiome dysbiosis in patients with hepatitis B virus-related hepatocellular carcinoma after extended hepatectomy liver failure. *Ann Transl Med*. 2022.
- [45] Wallen ZD, et al. Metagenomics of Parkinson's disease implicates the gut microbiome in multiple disease mechanisms. *Nat Commun*. 2022.
- [46] Yan H, et al. Gut microbiome alterations in patients with visceral obesity based on quantitative computed tomography. *Front Cell Infect Microbiol*. 2022.
- [47] Zhang W-H, et al. Fecal microbiota transplantation ameliorates active ulcerative colitis by downregulating pro-inflammatory cytokines in mucosa and serum. *Front Microbiol*. 2022.
- [48] Di Vincenzo F, et al. Gut microbiota, intestinal permeability, and systemic inflammation: a narrative review. *Intern Emerg Med*. 2023.
- [49] Mena-Vázquez N, et al. Adiposity is associated with expansion of the genus Dialister in rheumatoid arthritis patients. *Biomed Pharmacother*. 2023.
- [50] Patumcharoenpol P, et al. Exploring longitudinal gut microbiome towards metabolic functional changes associated in atopic dermatitis in early childhood. *Biology (Basel)*. 2023.
- [51] Squillario M, et al. Gut-microbiota in children and adolescents with obesity: inferred functional analysis and machine-learning algorithms to classify microorganisms. *Sci Rep*. 2023.
- [52] Tap J, et al. Global branches and local states of the human gut microbiome define associations with environmental and intrinsic factors. *Nat Commun*. 2023.
- [53] Penders J, et al. Molecular fingerprinting of the intestinal microbiota of infants in whom atopic eczema was or was not developing. *Clin Exp Allergy*. 2006.
- [54] Candela M, et al. Unbalance of intestinal microbiota in atopic children. *BMC Microbiol*. 2012.
- [55] Eppinga H, et al. Similar depletion of protective Faecalibacterium prausnitzii in psoriasis and inflammatory bowel disease, but not in hidradenitis suppurativa. *J Crohn's Colitis*. 2016.
- [56] Tang MF, et al. Eczema susceptibility and composition of fecal microbiota at 4 weeks of age: a pilot study in Chinese infants. *Br J Dermatol*. 2016.
- [57] Zheng H, et al. Altered gut microbiota composition associated with eczema in infants. *PLoS One*. 2016.
- [58] Vaughn AR, et al. Skin-gut axis: the relationship between intestinal bacteria and skin health. *World J Dermatol*. 2017.
- [59] Tan L, et al. The Akkermansia muciniphila is a gut microbiota signature in psoriasis. *Exp Dermatol*. 2018.
- [60] Yan HM, et al. Gut microbiota alterations in moderate to severe acne vulgaris patients. *J Dermatol*. 2018.
- [61] Hidalgo-Cantabrana C, et al. Gut microbiota dysbiosis in a cohort of patients with psoriasis. *Br J Dermatol*. 2019.
- [62] Myers B, et al. The gut microbiome in psoriasis and psoriatic arthritis. *Best Pract Res Clin Rheumatol*. 2019.
- [63] Salem I, et al. The gut microbiome as a major regulator of the gut-skin axis. *Front Microbiol*. 2019.
- [64] Visser M, et al. Bacterial dysbiosis and translocation in psoriasis vulgaris. *Front Cell Infect Microbiol*. 2019.
- [65] Chen L, et al. Skin and gut microbiome in psoriasis: gaining insight into the pathophysiology and finding novel therapeutic strategies. *Front Microbiol*. 2020.
- [66] Chen Y-J, et al. An altered fecal microbial profiling in rosacea patients compared to matched controls. *J Formos Med Assoc*. 2020.
- [67] Dei-Cas I, et al. Metagenomic analysis of gut microbiota in non-treated plaque psoriasis patients stratified by disease severity: development of a new Psoriasis-Microbiome Index. *Sci Rep*. 2020.
- [68] Hsu D, et al. Role of skin and gut microbiota in the pathogenesis of psoriasis, an inflammatory skin disease. *Microecol Med*. 2020.
- [69] Yegorov S, et al. Psoriasis is associated with elevated gut IL-1 α and intestinal microbiome alterations. *Front Immunol*. 2020.
- [70] De Pessemer B, et al. Gut-skin axis: current knowledge of the interrelationship between microbial dysbiosis and skin conditions. *Microorganisms*. 2021.
- [71] Olejniczak-Staruch I, et al. Alterations of the skin and gut microbiome in psoriasis and psoriatic arthritis. *Int J Mol Sci*. 2021.
- [72] Park DH, et al. Comparative analysis of the microbiome across the gut-skin axis in atopic dermatitis. *Int J Mol Sci*. 2021.
- [73] Mahmud MR, et al. Impact of gut microbiome on skin health: gut-skin axis observed through the lenses of therapeutics and skin diseases. *Gut Microbes*. 2022.
- [74] Lee MJ, et al. Disordered development of gut microbiome interferes with the establishment of the gut ecosystem during early childhood with atopic dermatitis. *Gut Microbes*. 2022.
- [75] Liu C, et al. Correlation analysis between gut microbiota characteristics and melasma. *Front Microbiol*. 2022.
- [76] Thye AY-K, et al. Gut-skin axis: unravelling the connection between the gut microbiome and psoriasis. *Biomedicines*. 2022.
- [77] Ley RE, et al. Microbial ecology: human gut microbes associated with obesity. *Nature*. 2006.
- [78] Turnbaugh PJ, et al. A core gut microbiome in obese and lean twins. *Nature*. 2009.
- [79] Schwertz A, et al. Microbiota and SCFA in lean and overweight healthy subjects. *Obesity*. 2010.
- [80] Clarke SF, et al. The gut microbiota and its relationship to diet and obesity. *Gut Microbes*. 2012.
- [81] Ahmad R, et al. Gut permeability and mucosal inflammation: bad, good or context dependent. *Mucosal Immunol*. 2017.
- [82] Menni C, et al. Gut microbiome diversity and high-fiber intake are related to lower long-term weight gain. *Int. Journal of Obesity*. 2017.
- [83] Del Chierico F, et al. Gut microbiota markers in obese adolescent and adult patients: age-dependent differential patterns. *Front Microbiol*. 2018.
- [84] Gao X, et al. Body mass index differences in the gut microbiota are gender-specific. *Frontiers in Microbiology*. 2018.

- [85] Hjorth MF, et al. Prevotella to Bacteroides ratio predicts body weight and fat loss success on 24-week diets varying in macronutrient composition and dietary fiber: results from a post-hoc analysis. *Int. Journal of Obesity*. 2018.
- [86] Heianza Y, et al. Changes in gut microbiota-related metabolites and long-term successful weight loss in response to weight-loss diets: The POUNDS Lost Trial. *Diabetes Care*. 2018.
- [87] Frost F, et al. A structured weight loss program increases gut microbiota phylogenetic diversity and reduces levels of Collinsella in obese type 2 diabetics: a pilot study. *PLoS ONE*. 2019.
- [88] de Clercq NC, et al. Weight gain after fecal microbiota transplantation in a patient with recurrent underweight following clinical recovery from anorexia nervosa. *Psychother Psychosom*. 2019.
- [89] Carmody RN, et al. Roles of the gut microbiome in weight management. *Nature Review Microbiology*. 2023.
- [90] van Hul M, et al. The gut microbiota in obesity and weight management: microbes as friends or foe? *Nat Rev Endocrinol*. 2023.
- [91] Martel J, et al. Gut barrier disruption and chronic disease. *Cell Trends Endocrinol Metab*. 2024.
- [92] Quévrain E, et al. Identification of an anti-inflammatory protein from *Faecalibacterium prausnitzii*, a commensal bacterium deficient in Crohn's disease. *Gut*. 2016.
- [93] Hiippala K, et al. The potential of gut commensals in reinforcing intestinal barrier function and alleviating inflammation. *Nutrients*. 2018.
- [94] Ghosh S, et al. Regulation of intestinal barrier function by microbial metabolites. *Cell Mol Gastroenterol Hepatol*. 2021.
- [95] Kinashi T, et al. Partners in leaky gut syndrome: intestinal dysbiosis and autoimmunity. *Front Immunol*. 2021.
- [96] Swidsinski A, et al. Spatial organization and composition of the mucosal flora in patients with inflammatory bowel disease. *J Clin Microbiol*. 2005.
- [97] Malinen E, et al. Analysis of the fecal microbiota of irritable bowel syndrome patients and healthy controls with real-time PCR. *Am J Gastroenterol*. 2005.
- [98] Kassinen A, et al. The fecal microbiota of irritable bowel syndrome patients differs significantly from that of healthy subjects. *Gastroenterology*. 2007.
- [99] Lyra A, et al. Diarrhea-predominant irritable bowel syndrome distinguishable by 16S rRNA gene phylotype quantification. *World J Gastroenterol*. 2009.
- [100] Rajičić-Stojanović M, et al. Global and deep molecular analysis of microbiota signatures in fecal samples from patients with irritable bowel syndrome. *Gastroenterology*. 2011.
- [101] Jeffery IB, et al. An irritable bowel syndrome subtype defined by species-specific alterations in fecal microbiota. *Gut*. 2012.
- [102] Jalanka-Tuovinen J, et al. Faecal microbiota composition and host-microbe cross-talk following gastroenteritis and in post-infectious irritable bowel syndrome. *BMJ Gut*. 2014.
- [103] Rajičić-Stojanović M, et al. Intestinal microbiota and diet in IBS: causes, consequences, or epiphenomena? *Am J Gastroenterol*. 2015.
- [104] Lopetuso LR, et al. Gut microbiota in health, diverticular disease, irritable bowel syndrome, and inflammatory bowel diseases: time for microbial markers of gastrointestinal disorders. *Dig Dis*. 2017.
- [105] Vich Vila A, et al. Gut microbiota composition and functional changes in inflammatory bowel disease and irritable bowel syndrome. *Sci Transl Med*. 2018.
- [106] Enck P, et al. Dysbiosis in functional bowel disorders. *Ann Nutr Metab*. 2018.
- [107] Rizzello F. Dietary geraniol ameliorates intestinal dysbiosis and relieves symptoms in irritable bowel syndrome patients: a pilot study. *BMC Complement Altern Med*. 2018.
- [108] Hod K, et al. The effect of a multispecies probiotic on microbiota composition in a clinical trial of patients with diarrhea-predominant irritable bowel syndrome. *Neurogastroenterol Motil*. 2018.
- [109] Fodor A, et al. Rifaximin is associated with modest, transient decreases in multiple taxa in the gut microbiota of patients with diarrhea-predominant irritable bowel syndrome. *Gut Microbes*. 2019.
- [110] Pittayanon R, et al. Gut microbiota in patients with irritable bowel syndrome—A systematic review. *Gastroenterology*. 2019.
- [111] Agnello M, et al. Gut microbiome composition and risk factors in a large cross-sectional IBS cohort. *BMJ Open Gastroenterol*. 2020.
- [112] Masoodi I, et al. Microbial dysbiosis in irritable bowel syndrome: a single-center metagenomic study in Saudi Arabia. *JGH Open*. 2020.
- [113] Yang M, et al. Mucosal-associated microbiota other than luminal microbiota has a close relationship with diarrhea-predominant irritable bowel syndrome. 2020.
- [114] Barandouzi Z, et al. Altered gut microbiota in irritable bowel syndrome and its association with food components. *J Pers Med*. 2021.
- [115] Baldelli V, et al. The role of Enterobacteriaceae in gut microbiota dysbiosis in inflammatory bowel diseases. *Microorganisms*. 2021.
- [116] Ghosh S, et al. Regulation of intestinal barrier function by microbial metabolites. *Cell Mol Gastroenterol Hepatol*. 2021.
- [117] Kinashi, et al. Partners in leaky gut syndrome: intestinal dysbiosis and autoimmunity. *Front Immunol*. 2021.
- [118] Scivilla P, et al. Gut microbiota profiles and characterization of cultivable fungal isolates in IBS patients. *Applied Microbiology and Biotechnology*. 2021.
- [119] Pimentel M, et al. ACG clinical guideline: Small intestinal bacterial overgrowth. *The American Journal of Gastroenterology*. 2020.
- [120] Ghosal U, et al. Small intestinal bacterial overgrowth in patients with inflammatory bowel disease: A case-control study. *Indian Journal of Gastroenterology*. 2021.
- [121] Banaszak M, et al. Association between gut dysbiosis and the occurrence of SIBO, LIBO, SIFO and IMO. *Microorganisms*. 2023.
- [122] Knez E, et al. The importance of food quality, gut motility and microbiome in SIBO development and treatment. *Nutrition*. 2024.
- [123] Lu S, et al. Differences in clinical manifestations and the fecal microbiome between irritable bowel syndrome and small intestinal bacterial overgrowth. *Digestive and Liver Disease*. 2024.
- [124] Hansen LBS, et al. A low-gluten diet induces changes in the intestinal microbiome of healthy Danish adults. *Nature*. 2018.
- [125] Cardoso-Silva D, et al. Intestinal barrier function in gluten-related disorders. *Nutrients*. 2019.
- [126] Volta U, et al. Nonceliac wheat sensitivity: An immune-mediated condition with systemic manifestations. *Gastroenterology Clinics of North America*. 2019.
- [127] Nobel YR, et al. Lack of effect of gluten challenge on fecal microbiome in patients with celiac disease and non-celiac gluten sensitivity. *Clinical and Translational Gastroenterology*. 2021.
- [128] Clapp M, Aurora N, Herrera L, Bhatia M, Wlen E, Wakefield S. Gut microbiota's effect on mental health: The gut-brain axis. *Clin Pract*. 2017 Sep 15;7(4):987.
- [129] Shoubridge, A.P., Choo, J.M., Martin, A.M. et al. The gut microbiome and mental health: advances in research and emerging priorities. *Mol Psychiatry* 27, 1908–1919 (2022).
- [130] Skonieczna-Żydecka, K.; Marlicz, W.; Misera, A.; Koulaouzidis, A.; Łoniewski, I. Microbiome—The Missing Link in the Gut-Brain Axis: Focus on Its Role in Gastrointestinal and Mental Health. *J. Clin. Med.* 2018, 7, 521.
- [131] Moloney, R.D., Desbonnet, L., Clarke, G. et al. The microbiome: stress, health and disease. *Mamm Genome* 25, 49–74 (2014).
- [132] Loh, J.S., Mak, W.Q., Tan, L.K.S. et al. Microbiota–gut–brain axis and its therapeutic applications in neurodegenerative diseases. *Sig Transduct Target Ther* 9, 37 (2024).
- [133] Verma A, Insicht SS, Bhargava A. Gut-Brain Axis: Role of Microbiome, Metabolites, Hormones, and Stress in Mental Health Disorders. *Cells*. 2024 Aug 27;13(17):1436. doi: 10.3390/cells13171436. PMID: 39273008; PMCID: PMC11394554.
- [134] Chen CY, Wang YF, Lei L, Zhang Y. Impacts of microbiota and its metabolites through gut-brain axis on pathophysiology of major depressive disorder. *Life Sci*. 2024 Aug 15;351:122815. doi: 10.1016/j.lfs.2024.122815. Epub 2024 Jun 10. PMID: 38866215.
- [135] Monda V, Villano I, Messina A, Valenzano A, Esposito T, Moscatelli F, Viggiano A, Cibelli G, Chieffi S, Monda M, Messina G. Exercise Modifies the Gut Microbiota with Positive Health Effects. *Oxid Med Cell Longev*. 2017;2017:3831972.
- [136] Cataldi S, Bonavolontà V, Poli L, Clemente FM, De Candia M, Carvutto R, Silva AF, Badicu G, Greco G, Fischetti F. The Relationship between Physical Activity, Physical Exercise, and Human Gut Microbiota in Healthy and Unhealthy Subjects: A Systematic Review. *Biology (Basel)*. 2022 Mar 21;11(3):479.
- [137] Clauss M, Gérard P, Mosca A and Leclerc M (2021) Interplay Between Exercise and Gut Microbiome in the Context of Human Health and Performance. *Front. Nutr.* 8:637010.
- [138] Dziewiecka, H., Buttar, H.S., Kasperska, A. et al. Physical activity induced alterations of gut microbiota in humans: a systematic review. *BMC Sports Sci Med Rehabil* 14, 122 (2022).
- [139] Fontana, F., Longhi, G., Tarracchini, C. et al. The human gut microbiome of athletes: metagenomic and metabolic insights. *Microbiome* 11, 27 (2023).
- [140] Yun S, Seo Y, Lee Y, Lee DT. Gut microbiome related to metabolic diseases after moderate-to-vigorous intensity exercise. *J Exerc Sci Fit*. 2024 Oct;22(4):375-382. doi: 10.1016/j.jesf.2024.07.003. Epub 2024 Jul 25. PMID: 39185003; PMCID: PMC11342187.
- [141] Ghaffar T, Ubaldi F, Volpini V, Valeriani F, Romano Spica V. The Role of Gut Microbiota in Different Types of Physical Activity and Their Intensity: Systematic Review and Meta-Analysis. *Sports (Basel)*. 2024 Aug 14;12(8):221. doi: 10.3390/sports12080221. PMID: 39195597; PMCID: PMC11360093.
- [142] Fontana F, Longhi G, Tarracchini C, Mancabelli L, Lugli GA, Alessandri G, Turroni F, Milani C, Ventura M. The human gut microbiome of athletes: metagenomic and metabolic insights. *Microbiome*. 2023 Feb 14;11(1):27. doi: 10.1186/s40168-023-01470-9. PMID: 36782241; PMCID: PMC9926762.
- [143] Diet-gut microbiome interaction and its impact on host blood glucose homeostasis: a series of nutritional n-of-1 trials Fu, Yuanqing et al. *eBioMedicine*, Volume 111, 105483.
- [144] Palmnäs-Bédard MSA, Costabile G, Vetrani C, Åberg S, Hjalmarsson Y, Dickved J, Riccardi G, Landberg R. The human gut microbiota and glucose metabolism: a scoping review of key bacteria and the potential role of SCFAs. *Am J Clin Nutr*. 2022 Oct 6;116(4):862-874.
- [145] Glucose alters the symbiotic relationships between gut microbiota and host physiology. Fernando F. Anhe, Nicole G. Barra, and Jonathan D. Schertzer *American Journal of Physiology-Endocrinology and Metabolism* 2020;318:2, E111-E116.
- [146] Dulai, A.S.; Min, M.; Sivamani, R.K. The Gut Microbiome's Influence on Incretins and Impact on Blood Glucose Control. *Biomedicines* 2024, 12, 2719.
- [147] Kristina M. Utzschneider, Mario Kratz, Chris J. Damman, Meredith Hullarg, Mechanisms Linking the Gut Microbiome and Glucose Metabolism, *The Journal of Clinical Endocrinology & Metabolism*, Volume 101, Issue 4, 1 April 2016, Pages 1445–1454
- [148] Poll BG, Cheema MU, Pluznick JL. Gut Microbial Metabolites and Blood Pressure Regulation: Focus on SCFAs and TMAO. *Physiology (Bethesda)*. 2020 Jul 1;35(4):275-284.
- [149] O'Donnell JA, Zheng T, Meric G, Marques FZ. The gut microbiome and hypertension. *Nat Rev Nephrol*. 2023 Mar;19(3):153-167.
- [150] Yang, Z., Wang, Q., Liu, Y., Wang, L., Ge, Z., Li, Z., ... Wu, C. (2023). Gut microbiota and hypertension: association, mechanisms and treatment. *Clinical and Experimental Hypertension*, 45(1).
- [151] Al Khodor S, Reichert B and Shatat IF (2017) The Microbiome and Blood Pressure: Can Microbes Regulate Our Blood Pressure? *Front. Pediatr.* 5:138.
- [152] Dinakis E, Nakai M, Gill P, Ribeiro R, Yialourou S, Sata Y, Muir J, Carrington M, Head GA, Kaye DM, Marques FZ. Association Between the Gut Microbiome and Their Metabolites With Human Blood Pressure Variability. *Hypertension*. 2022 Aug;79(8):1690-1701.
- [153] Ge, Y., Wang, J., Wu, L., & Wu, J. (2024). Gut microbiota: A potential new regulator of hypertension. *Frontiers in Cardiovascular Medicine*, 11. *Frontiers | Gut microbiota: a potential new regulator of hypertension*
- [154] Hsu, C.L., Schnabl, B. The gut-liver axis and gut microbiota in health and liver disease. *Nat Rev Microbiol* 21, 719–733 (2023).
- [155] Tilg H, Adolph TE, Trauner M. Gut-liver axis: Pathophysiological concepts and clinical implications. *Cell Metab*. 2022 Nov 1;34(11):1700-1718.
- [156] Tripathi, A., Debelius, J., Brenner, D.A. et al. The gut-liver axis and the intersection with the microbiome. *Nat Rev Gastroenterol Hepatol* 15, 397–411 (2018).
- [157] Milosevic, I.; Vujovic, A.; Barac, A.; Djelic, M.; Korac, M.; Radovanovic Spurnic, A.; Gmizic, I.; Stevanovic, O.; Djordjevic, V.; Lelic, N.; et al. Gut-Liver Axis, Gut Microbiota, and Its Modulation in the Management of Liver Diseases: A Review of the Literature. *Int. J. Mol. Sci.* 2019, 20, 395.
- [158] Fang L and Ning J (2024) Recent advances in gut microbiota and thyroid disease: pathogenesis and therapeutics in autoimmune, neoplastic, and nodular conditions. *Front. Cell. Infect. Microbiol.* 14:1465928.
- [159] Knezevic J, Starchi C, Tmava Berisha A, Amrein K. Thyroid-Gut-Axis: How Does the Microbiota Influence Thyroid Function? *Nutrients*. 2020 Jun 12;12(6):1769.
- [160] Xie L, Zhao H and Chen W (2023) Relationship between gut microbiota and thyroid function: a two-sample Mendelian randomization study. *Front. Endocrinol.* 14:1240752.
- [161] Sessa L, Malavolta E, Sodero G, Cipolla C, Rigante D. The conspiring role of gut microbiota as primer of autoimmune thyroid diseases: A scoping focus. *Autoimmun Rev.* 2025 Apr 30;24(5):103780.

- [162] Shi C, Chen J, He S, Zhang Y, Zhang Y and Yu L (2024) Cross-talk between the gut microbiota and hypothyroidism: a bidirectional two-sample Mendelian randomization study. *Front. Nutr.* 11:1286593. doi: 10.3389/fnut.2024.1286593
- [163] Wong, M., & Inder, W. J. (2018). Alternating hyperthyroidism and hypothyroidism in Graves' disease. *Clinical case reports*, 6(9), 1684–1688.
- [164] Mariat D, et al. The Firmicutes/Bacteroidetes ratio of the human microbiota changes with age. *BMC Microbiol.* 2009.
- [165] Magne F, et al. The Firmicutes/Bacteroidetes ratio: A relevant marker of gut dysbiosis in obese patients? *Nutrients.* 2020.
- [166] Stojanov S, et al. The influence of probiotics on the Firmicutes/Bacteroidetes ratio in the treatment of obesity and inflammatory bowel disease. *Microorganisms.* 2020.
- [167] Grigor'eva IN. Gallstone disease, obesity and the Firmicutes/Bacteroidetes ratio as a possible biomarker of gut dysbiosis. *J Pers Med.* 2021.
- [168] Holzapfel WH, et al. Taxonomy and important features of probiotic microorganisms in food and nutrition. *Am J Clin Nutr.* 2001.
- [169] Masco L, et al. Polyphasic taxonomic analysis of *Bifidobacterium animalis* and *Bifidobacterium lactis* reveals relatedness at the subspecies level: Reclassification of *Bifidobacterium animalis* as *Bifidobacterium animalis* subsp. *animalis* subsp. *nov.* and *Bifidobacterium lactis* as *Bifidobacterium animalis* subsp. *lactis* subsp. *nov.* *Int J Syst Evol Microbiol.* 2004.
- [170] Malinen E, et al. Association of symptoms with gastrointestinal microbiota in irritable bowel syndrome. *World J Gastroenterol.* 2010.
- [171] O'Callaghan A, et al. Bifidobacteria and their role as members of the human gut microbiota. *Front Microbiol.* 2016.
- [172] Rivière A, et al. Bifidobacteria and butyrate-producing colon bacteria: Importance and strategies for their stimulation in the human gut. *Front Microbiol.* 2016.
- [173] Marco ML, et al. Health benefits of fermented foods: Microbiota and beyond. *Curr Opin Biotechnol.* 2017.
- [174] Liu YW, et al. New perspectives of *Lactobacillus plantarum* as a probiotic: The gut-heart-brain axis. *J Microbiol.* 2018.
- [175] Heeney DD, et al. Intestinal *Lactobacillus* in health and disease: A driver or just along for the ride? *Curr Opin Biotechnol.* 2018.
- [176] Mayengbam S, et al. Impact of dietary fiber supplementation on modulating microbiota-host-metabolic axes in obesity. *J Nutr Biochem.* 2018.
- [177] Westerik N, et al. *Lactobacillus rhamnosus* probiotic food as a tool for empowerment across the value chain in Africa. *Front Microbiol.* 2018.
- [178] Capurso L, et al. Thirty years of *Lactobacillus rhamnosus* GG: A review. *J Clin Gastroenterol.* 2019.
- [179] Turrioni F, et al. *Bifidobacterium bifidum*: A key member of the early human gut microbiota. *Microorganisms.* 2019.
- [180] Zhang T, et al. *Akkermansia muciniphila* is a promising probiotic. *Microb Biotechnol.* 2019.
- [181] Markowiak-Kopeć L, et al. The effect of probiotics on the production of short-chain fatty acids by the human intestinal microbiome. *Nutrients.* 2020.
- [182] Naumova N, et al. Human gut microbiome response to short-term *Bifidobacterium*-based probiotic treatment. *Indian J Microbiol.* 2020.
- [183] Teame T, et al. Paraprobiotics and postbiotics of probiotic *Lactobacilli*, their positive effects on the host and action mechanisms: A review. *Front Nutr.* 2020.
- [184] Wang H, et al. The potential therapeutic role of *Lactobacillus reuteri* for treatment of inflammatory bowel disease. *Am J Transl Res.* 2020.
- [185] Bengoa AA, et al. Health-promoting properties of *Lactocaseibacillus paracasei*: A focus on kefir isolates and exopolysaccharide-producing strains. *Foods.* 2021.
- [186] Chen J, et al. Recent development of probiotic *Bifidobacteria* for treating human diseases. *Front Bioeng Biotechnol.* 2021.
- [187] Paul AK, et al. Probiotics and amelioration of rheumatoid arthritis: Significant roles of *Lactobacillus casei* and *Lactobacillus acidophilus*. *Microorganisms.* 2021.
- [188] Dempsey E, et al. *Lactobacillus* spp. for gastrointestinal health: Current and future perspectives. *Front Immunol.* 2022.
- [189] Gao H, et al. The functional roles of *Lactobacillus acidophilus* in different physiological and pathological processes. *J Microbiol Biotechnol.* 2022.
- [190] Luo Y, et al. Rational consideration of *Akkermansia muciniphila* targeting intestinal health: Advantages and challenges. *npj Biofilms Microbiomes.* 2022.
- [191] Echegaray N, et al. A novel approach to *Lactiplantibacillus plantarum*: From probiotic properties to the omics insights. *Microbiol Res.* 2023.
- [192] Guo H, et al. The potential therapeutic role of *Lactobacillaceae rhamnosus* for treatment of inflammatory bowel disease. *Foods.* 2023.
- [193] Yu Z, et al. The role of potential probiotic strains *Lactobacillus reuteri* in various intestinal diseases: New roles for an old player. *Front Microbiol.* 2023.
- [194] Huang JY, Lee SM, Mazmanian SK. The human commensal *Bacteroides fragilis* binds intestinal mucin. *Anaerobe.* 2011.
- [195] McDermott AJ, Huffnagle GB. The microbiome and regulation of mucosal immunity. *Immunology.* 2014.
- [196] Cornick S, Tawiah A, Chadee K. Roles and regulation of the mucus barrier in the gut. *Tissue Barriers.* 2015.
- [197] King SJ, McCole DF. Epithelial-microbial diplomacy: escalating border tensions drive inflammation in inflammatory bowel disease. *Intest Res.* 2019.
- [198] Qi H, et al. *Lactobacillus* maintains healthy gut mucosa by producing L-Ornithine. *Commun Biol.* 2019.
- [199] Paone P, Cani PD. Mucus barrier, mucins and gut microbiota: the expected slimy partners? *Gut.* 2020.
- [200] Fang J, et al. Slimy partners: the mucus barrier and gut microbiome in ulcerative colitis. *Exp Mol Med.* 2021.
- [201] Glover JS, et al. Characterizing the mucin-degrading capacity of the human gut microbiota. *Sci Rep.* 2022.
- [202] Lee JH, et al. A mucin-responsive hybrid two-component system controls *Bacteroides thetaiotaomicron* colonization and gut homeostasis. *J Microbiol.* 2022.
- [203] Liu MJ, et al. Recent findings in *Akkermansia muciniphila*-regulated metabolism and its role in intestinal diseases. *Clin Nutr.* 2022.
- [204] Rodrigues VF, et al. *Akkermansia muciniphila* and gut immune system: A good friendship that attenuates inflammatory bowel disease, obesity, and diabetes. *Front Immunol.* 2022.
- [205] Qin D, et al. Contribution of *Lactobacilli* on intestinal mucosal barrier and diseases: Perspectives and challenges of *Lactobacillus casei*. *Life (Basel).* 2022.
- [206] Gutierrez A, et al. *Bifidobacterium* and the intestinal mucus layer. *Microbiome Res Rep.* 2023.
- [207] He Q, et al. Protective effects of a new generation of probiotic *Bacteroides fragilis* against colitis in vivo and in vitro. *Sci Rep.* 2023.
- [208] Luis AS, Hansson GC. Intestinal mucus and their glycans: A habitat for thriving microbiota. *Cell Host Microbe.* 2023.
- [209] Pellegrino A, et al. Role of *Akkermansia* in human diseases: From causation to therapeutic properties. *Nutrients.* 2023.
- [210] Barcenilla A, et al. Phylogenetic relationships of butyrate-producing bacteria from the human gut. *Appl Environ Microbiol.* 2000.
- [211] Duncan SH, et al. Growth requirements and fermentation products of *Fusobacterium prausnitzii*, and a proposal to reclassify it as *Faecalibacterium prausnitzii* gen. nov., comb. nov. *Int J Syst Evol Microbiol.* 2002.
- [212] Schwierz A, et al. *Anaerostipes caccae* gen. nov., sp. nov., a new saccharolytic, acetate-utilising, butyrate-producing bacterium from human faeces. *Syst Appl Microbiol.* 2002.
- [213] Hold GL, et al. Oligonucleotide probes that detect quantitatively significant groups of butyrate-producing bacteria in human feces. *Appl Environ Microbiol.* 2003.
- [214] Duncan SH, et al. Contribution of acetate to butyrate formation by human faecal bacteria. *Br J Nutr.* 2004.
- [215] Duncan SH, et al. Lactate-utilizing bacteria, isolated from human feces, that produce butyrate as a major fermentation product. *Appl Environ Microbiol.* 2004.
- [216] Duncan SH, et al. Proposal of *Roseburia faecis* sp. nov., *Roseburia hominis* sp. nov. and *Roseburia inulinivorans* sp. nov., based on isolates from human faeces. *Int J Syst Evol Microbiol.* 2006.
- [217] Louis P, et al. Diversity, metabolism and microbial ecology of butyrate-producing bacteria from the human large intestine. *FEMS Microbiol Lett.* 2009.
- [218] Miquel S, et al. Ecology and metabolism of the beneficial intestinal commensal bacterium *Faecalibacterium prausnitzii*. *Gut Microbes.* 2014.
- [219] Miquel S, et al. Identification of metabolic signatures linked to anti-inflammatory effects of *Faecalibacterium prausnitzii*. *MBio.* 2015.
- [220] Engels C, et al. The common gut microbe *Eubacterium hallii* also contributes to intestinal propionate formation. *Front Microbiol.* 2016.
- [221] Rivière A, et al. Bifidobacteria and butyrate-producing colon bacteria: importance and strategies for their stimulation in the human gut. *Front Microbiol.* 2016.
- [222] Lopez-Siles M, et al. *Faecalibacterium prausnitzii*: from microbiology to diagnostics and prognostics. *ISME J.* 2017.
- [223] Tamani-Shacoort Z, et al. *Roseburia* spp.: A marker of health? *Future Microbiol.* 2017.
- [224] Bui TPN, et al. Mutual metabolic interactions in co-cultures of the intestinal *Anaerostipes rhamnosivorans* with an acetogen, methanogen, or pectin-degrader affecting butyrate production. *Front Microbiol.* 2019.
- [225] Chia LW, et al. *Bacteroides thetaiotaomicron* fosters the growth of butyrate-producing *Anaerostipes caccae* in the presence of lactose and total human milk carbohydrates. *Microorganisms.* 2020.
- [226] Van Hul M, et al. From correlation to causality: the case of *Subdoligranulum*. *Gut Microbes.* 2020.
- [227] Nie K, et al. *Roseburia intestinalis*: A beneficial gut organism from the discoveries in genus and species. *Front Cell Infect Microbiol.* 2021.
- [228] Singh V, et al. Butyrate producers, "The Sentinel of Gut": Their intestinal significance with and beyond butyrate, and prospective use as microbial therapeutics. *Front Microbiol.* 2023.
- [229] Notting F, et al. The butyrate-producing and spore-forming bacterial genus *Coprococcus* as a potential biomarker for neurological disorders. *Gut Microbiome.* 2023.
- [230] Kadowaki R, et al. Spore-forming properties and enhanced oxygen tolerance of butyrate-producing *Anaerostipes* spp. *Anaerobe.* 2023.
- [231] Siptroth J, et al. Variation of butyrate production in the gut microbiome in type 2 diabetes patients. *Int Microbiol.* 2023.
- [232] Gibson G, et al. Sulphate-reducing bacteria and hydrogen metabolism in the human large intestine. *Gut.* 1993.
- [233] Loubinoux J, et al. Sulfate-reducing bacteria in human feces and their association with inflammatory bowel diseases. *FEMS Microbiol Ecol.* 2002.
- [234] Jia W, et al. Diversity and distribution of sulphate-reducing bacteria in human faeces from healthy subjects and patients with inflammatory bowel disease. *FEMS Immunol Med Microbiol.* 2012.
- [235] Rey FE, et al. Metabolic niche of a prominent sulfate-reducing human gut bacterium. *Proc Natl Acad Sci U S A.* 2013.
- [236] David LA, et al. Diet rapidly and reproducibly alters the human gut microbiome. *Nature.* 2014.
- [237] Feng Y, et al. Enrichment of sulfidogenic bacteria from the human intestinal tract. *FEMS Microbiol Lett.* 2017.
- [238] Chen YR, et al. Isolation of *Desulfovibrio* spp. from human gut microbiota using a next-generation sequencing directed culture method. *Lett Appl Microbiol.* 2019.
- [239] Dostal Webster A, et al. Influence of short-term changes in dietary sulfur on the relative abundances of intestinal sulfate-reducing bacteria. *Gut Microbes.* 2019.
- [240] Kuskhevych I, et al. The sulfate-reducing microbial communities and meta-analysis of their occurrence during diseases of small-large intestine axis. *J Clin Med.* 2019.
- [241] Dordević D, et al. Hydrogen sulfide toxicity in the gut environment: Meta-analysis of sulfate-reducing and lactic acid bacteria in inflammatory processes. *J Adv Res.* 2020.
- [242] Kuskhevych I, et al. Recent advances in metabolic pathways of sulfate reduction in intestinal bacteria. *Cells.* 2020.
- [243] Burrichter AG, et al. Bacterial microcompartments for isethionate desulfonation in the taurine-degrading human-gut bacterium *Bilophila wadsworthia*. *BMC Microbiol.* 2021.
- [244] Chen YR, et al. *Desulfovibrio* is not always associated with adverse health effects in the Guangdong Gut Microbiome Project. *PeerJ.* 2021.
- [245] Lu G, et al. Diversity and comparison of intestinal *Desulfovibrio* in patients with liver cirrhosis and healthy people. *Microorganisms.* 2023.
- [246] Singh SB, et al. *Desulfovibrio* in the gut: The enemy within? *Microorganisms.* 2023.
- [247] Xie R, et al. *Desulfovibrio vulgaris* interacts with novel gut epithelial immune receptor LRRIC19 and exacerbates colitis. *Microbiome.* 2024.
- [248] Brown C, et al. The monoamine oxidase inhibitor—tyramine interaction. *The Journal of Clinical Pharmacology.* 1989.
- [249] Cummings JH, Macfarlane GT. Dietary fiber and the human gut microbiota. *Nutrients.* 1997.
- [250] Reiter RJ, Tan D. Melatonin: an antioxidant in edible plants. *Annals of the New York Academy of Sciences.* 2002.
- [251] Cherbut C, et al. *Acacia* gum is a bifidogenic dietary fibre with high digestive tolerance in healthy humans. *Microbial Ecology in Health and Disease.* 2003.

- [252] Iriti M, Faoro F. Grape phytochemicals: A bouquet of old and new nutraceuticals for human health. *Medical Hypotheses*. 2006.
- [253] Kinoshita T, et al. Cold-water face immersion per se elicits cardiac parasympathetic activity. *Circulation Journal*. 2006.
- [254] Reiter M, et al. Melatonin in edible plants (phytomelatonin): identification, concentrations, bioavailability and proposed functions. *World Review of Nutrition and Dietetics*. 2006.
- [255] Osman N, et al. Probiotics and blueberry attenuate the severity of dextran sulfate sodium (DSS)-induced colitis. *Digestive Diseases and Sciences*. 2008.
- [256] Holma R, et al. Constipation is relieved more by rye bread than wheat bread or laxatives without increased adverse gastrointestinal effects. *The Journal of Nutrition*. 2010.
- [257] Pérez-Jiménez J, et al. Identification of the 100 richest dietary sources of polyphenols: an application of the Phenol-Explorer database. *European Journal of Clinical Nutrition*. 2010.
- [258] Block SG, et al. Exacerbation of facial acne vulgaris after consuming pure chocolate. *Journal of the American Academy of Dermatology*. 2011.
- [259] Farinatti PT, et al. Acute effects of stretching exercise on the heart rate variability in subjects with low flexibility levels. *Journal of Strength and Conditioning Research*. 2011.
- [260] Russell WR, et al. High-protein, reduced-carbohydrate weight-loss diets promote metabolite profiles likely to be detrimental to colonic health. *The American Journal of Clinical Nutrition*. 2011.
- [261] Clemente JC, et al. The impact of the gut microbiota on human health: an integrative view. *Frontiers in Microbiology*. 2012.
- [262] Di Landro A, et al. Family history, body mass index, selected dietary factors, menstrual history, and risk of moderate to severe acne in adolescents and young adults. *Journal of the American Academy of Dermatology*. 2012.
- [263] Kim KA, et al. High-fat diet-induced gut microbiota exacerbates inflammation and obesity in mice via the TLR4 signaling pathway. *PLoS ONE*. 2012.
- [264] Queipo-Ortuño MI, et al. Influence of red wine polyphenols and ethanol on the gut microbiota ecology and biochemical biomarkers. *The American Journal of Clinical Nutrition*. 2012.
- [265] Biedermann L, et al. Bilberry ingestion improves disease activity in mild to moderate ulcerative colitis—an open pilot study. *Journal of Crohn's and Colitis*. 2013.
- [266] Delgado J, et al. Diets enriched with a Jerte Valley cherry-based nutraceutical product reinforce nocturnal behaviour in young and old animals of nocturnal (*Rattus norvegicus*) and diurnal (*Streptopelia risoria*) chronotypes. *Journal of Animal Physiology and Animal Nutrition*. 2013.
- [267] Dreher ML, Davenport AJ. Horticultural foods and health: the role of phytochemicals in nutrition and health promotion. *Journal of Horticultural Science & Biotechnology*. 2013.
- [268] Fritz JV, et al. The role of gut microbiota in metabolic syndrome: insights from genetic studies. *Nature Reviews Gastroenterology & Hepatology*. 2013.
- [269] Jelinek GA, et al. Association of fish consumption and omega-3 supplementation with quality of life, disability, and disease activity in an international cohort of people with multiple sclerosis. *International Journal of Neuroscience*. 2013.
- [270] Sae-Teaw M, et al. Serum melatonin levels and antioxidant capacities after consumption of pineapple, orange, or banana by healthy male volunteers. *Journal of Pineal Research*. 2013.
- [271] Spaeth AM, et al. Effects of experimental sleep restriction on weight gain, caloric intake, and meal timing in healthy adults. *Sleep*. 2013.
- [272] Festi D, et al. Gut microbiota and metabolic syndrome. *World Journal of Gastroenterology*. 2014.
- [273] Hansen AL, et al. Fish consumption, sleep, daily functioning, and heart rate variability. *Journal of Clinical Sleep Medicine*. 2014.
- [274] Jang SE, et al. Doenjang, a fermented Korean soybean paste, inhibits lipopolysaccharide production of gut microbiota in mice. *Journal of Medicinal Food*. 2014.
- [275] Katsigin R, et al. Low intake of vegetables, high intake of confectionary, and unhealthy eating habits are associated with poor sleep quality among middle-aged female Japanese workers. *Journal of Occupational Health*. 2014.
- [276] Panda S, et al. Structure and functions of the gut microbiome. *Endocrine, Metabolic & Immune Disorders-Drug Targets*. 2014.
- [277] Schoenaker DA, et al. The association between dietary factors and gestational hypertension and pre-eclampsia: a systematic review and meta-analysis of observational studies. *BMC Medicine*. 2014.
- [278] Chambers ES, et al. Effects of targeted delivery of propionate to the human colon on appetite regulation, body weight maintenance and adiposity in overweight adults. *Gut*. 2015.
- [279] Guilloty NI, et al. Diet, pre-pregnancy BMI, and gestational weight gain in Puerto Rican women. *Maternal and Child Health Journal*. 2015.
- [280] Kavuri V, et al. Irritable bowel syndrome: Yoga as remedial therapy. *Evidence-Based Complementary and Alternative Medicine*. 2015.
- [281] Merckx A, et al. Weight gain in healthy pregnant women in relation to pre-pregnancy BMI, diet and physical activity. *Midwifery*. 2015.
- [282] Pagliaro B, et al. Phytochemical compounds and protection from cardiovascular diseases: a state of the art. *BioMed Research International*. 2015.
- [283] Schmidt K, et al. Prebiotic intake reduces the waking cortisol response and alters emotional bias in healthy volunteers. *Psychopharmacology*. 2015.
- [284] Singh CK, et al. Resveratrol and cancer: challenges for clinical translation. *Biochimica et Biophysica Acta (BBA) - Molecular Basis of Disease*. 2015.
- [285] Shin D, et al. Dietary patterns during pregnancy are associated with risk of gestational diabetes mellitus. *Nutrients*. 2015.
- [286] Zulueta A, et al. Resveratrol: A potential challenger against gastric cancer. *World Journal of Gastroenterology*. 2015.
- [287] Braune A, et al. Bacterial species involved in the conversion of dietary flavonoids in the human gut. *Gut Microbes*. 2016.
- [288] Chausse B, et al. Microbiota modulation by dietary fibers: what is known and what needs to be elucidated? *Nutrients*. 2016.
- [289] Delost GR, et al. The impact of chocolate consumption on acne vulgaris in college students: A randomized crossover study. *Journal of the American Academy of Dermatology*. 2016.
- [290] Di Landro A, et al. Adult female acne and associated risk factors: Results of a multicenter case-control study in Italy. *Journal of the American Academy of Dermatology*. 2016.
- [291] Grossi E, et al. The constellation of dietary factors in adolescent acne: A semantic connectivity map approach. *Journal of the European Academy of Dermatology and Venerology*. 2016.
- [292] Konstantinidou, et al. Cardiorespiratory responses and reduced apneic time to cold-water face immersion after high intensity exercise. *Respiratory Physiology & Neurobiology*. 2016.
- [293] Kuršvietienė L, et al. Multiplicity of effects and health benefits of resveratrol. *Medicina*. 2016.
- [294] Roth S, et al. Bilberry-derived anthocyanins modulate cytokine expression in the intestine of patients with ulcerative colitis. *PLOS ONE*. 2016.
- [295] Turan N and Atabek Aşı T. The effect of abdominal massage on constipation and quality of life. *Gastroenterology Nursing*. 2016.
- [296] Vongravopap S and Asawanonda P. Dark chocolate exacerbates acne. *International Journal of Dermatology*. 2016.
- [297] Ziegler JU, et al. Wheat and the irritable bowel syndrome – FODMAP levels of modern and ancient species and their retention during bread making. *Journal of Functional Foods*. 2016.
- [298] Chekroud AM, et al. Relationship between dietary quality and gut microbiota in humans. *Nutrients*. 2017.
- [299] Fuller C, et al. Bedtime use of technology and associated sleep problems in children. *Global Pediatric Health*. 2017.
- [300] Gomes da Silva MF, et al. Yacon syrup: food applications and impact on satiety in healthy volunteers. *Food Research International*. 2017.
- [301] Garcia-Mazcorro JF, et al. Gut microbiome modulation by fermented foods. *Frontiers in Microbiology*. 2017.
- [302] Gibson GR, et al. Dietary prebiotics: definition and application. *Nature Reviews Gastroenterology & Hepatology*. 2017.
- [303] Hewlings S, Kalman D. Curcumin: A review of its effects on human health. *Foods*. 2017.
- [304] Johnson EL, et al. Microbiome and metabolic disease: revisiting the bacterial phylum Bacteroidetes. *Journal of Molecular Medicine*. 2017.
- [305] Maier TV, et al. Impact of dietary resistant starch on the human gut microbiome, metaproteome, and metabolome. *mBio*. 2017.
- [306] Reynolds AC, et al. The shift work and health research agenda: considering changes in gut microbiota as a pathway linking shift work, sleep loss and circadian misalignment, and metabolic disease. *Sleep Medicine Reviews*. 2017.
- [307] Vandeputte D, et al. Prebiotic inulin-type fructans induce specific changes in the human gut microbiota. *Gut*. 2017.
- [308] Yuen AWC and Sander JW. Can natural ways to stimulate the vagus nerve improve seizure control? *Epilepsy & Behavior*. 2017.
- [309] Adike A, et al. Small intestinal bacterial overgrowth. *Gastroenterology Clinics of North America*. 2018.
- [310] Alfa MJ, et al. A randomized trial to determine the impact of a digestion resistant starch composition on the gut microbiome in older and mid-age adults. *Clinical Nutrition*. 2018.
- [311] Durack J, et al. Involvement of the gut microbiome in diabetes and obesity. *International Journal of Molecular Sciences*. 2018.
- [312] Gao Q, et al. The association between vitamin D deficiency and sleep disorders: A systematic review and meta-analysis. *Nutrients*. 2018.
- [313] Ghosh S, Maji S. Dietary approaches to improve gut health. *Journal of Nutritional Science*. 2018.
- [314] González-Sarriás A, et al. The endotoxemia marker lipopolysaccharide-binding protein is reduced in overweight-obese subjects consuming pomegranate extract by modulating the gut microbiota: A randomized clinical trial. *Molecular Nutrition & Food Research*. 2018.
- [315] Hershner S, et al. The impact of a randomized sleep education intervention for college students. *Journal of Clinical Sleep Medicine*. 2018.
- [316] Kopf JC, et al. Role of whole grains versus fruits and vegetables in reducing subclinical inflammation and promoting gastrointestinal health in individuals affected by overweight and obesity: a randomized controlled trial. *Nutrition Journal*. 2018.
- [317] Korpela K, et al. Diet, microbiota, and metabolic health: trade-off between saccharolytic and proteolytic fermentation. *Annual Review of Food Science and Technology*. 2018.
- [318] Krebs-Smith SM, et al. Update of the Healthy Eating Index: HEI-2015. *Journal of the Academy of Nutrition and Dietetics*. 2018.
- [319] Niederreiter L, et al. Food, microbiome and colorectal cancer. *Digestive and Liver Disease*. 2018.
- [320] Schink M, et al. Microbial patterns in patients with histamine intolerance. *Journal of Physiology and Pharmacology*. 2018.
- [321] Venancio VP, et al. Polyphenol-rich mango (*Mangifera indica* L.) ameliorates functional constipation symptoms in humans beyond equivalent amount of fiber. *Molecular Nutrition & Food Research*. 2018.
- [322] Vital M, et al. Metagenomic insights into the degradation of resistant starch by human gut microbiota. *Applied and Environmental Microbiology*. 2018.
- [323] Aalemi AK, et al. Dairy consumption and acne: a case control study in Kabul, Afghanistan. *Clinical, Cosmetic and Investigational Dermatology*. 2019.
- [324] Chaix A, et al. Time-restricted eating to prevent and manage chronic metabolic diseases. *Annual Review of Nutrition*. 2019.
- [325] Chung WH, et al. Dietary factors influencing the gut microbiome in children: a systematic review. *Nutrients*. 2019.
- [326] Clos-García M, et al. Gut microbiome and serum metabolome analyses identify molecular biomarkers and altered glutamate metabolism in fibromyalgia. *eBioMedicine*. 2019.
- [327] Covasa M, et al. Intestinal sensing by gut microbiota: Targeting gut peptides. *Frontiers in Endocrinology*. 2019.
- [328] Dalton A, et al. Exercise influence on the microbiome-gut-brain axis. *Gut Microbes*. 2019.
- [329] Danneskiold-Samsøe NB, et al. Interplay between food and gut microbiota in health and disease. *Food Research International*. 2019.
- [330] Erdogan M, et al. The impact of dietary fat on gut microbiome: a systematic review. *Journal of Nutrition and Metabolism*. 2019.
- [331] Hermann J. Drug-nutrient interactions. 2019.
- [332] Hills R, et al. Gut microbiome: Profound implications for diet and disease. *Nutrients*. 2019.
- [333] Hjorth MF, et al. Prevotella-to-Bacteroides ratio predicts body weight and fat loss success on 24-week diets varying in macronutrient composition and dietary fiber: results from a post-hoc analysis. *International Journal of Obesity*. 2019.
- [334] Hmčirova L, et al. Human gut microbes are susceptible to antimicrobial food additives in vitro. *Folia Microbiologica*. 2019.
- [335] Kaczmarek JL, et al. Broccoli consumption affects the human gastrointestinal microbiota. *The Journal of Nutritional Biochemistry*. 2019.

- [336] Kanauchi M, et al. A novel dietary inflammatory index reflecting inflammatory ageing: Technical note. *Annals of Medicine and Surgery*. 2019.
- [337] Kårlund A, et al. Protein supplements and their relation with nutrition, microbiota composition, and health: is more protein always better for sportspeople? *Nutrients*. 2019.
- [338] Partula V, et al. Associations between usual diet and gut microbiota composition: results from the Milieu Intérieur cross-sectional study. *The American Journal of Clinical Nutrition*. 2019.
- [339] Rao TP, et al. Role of guar fiber in improving digestive health and function. *Nutrition*. 2019.
- [340] Saoji AA, et al. Effects of yogic breath regulation: A narrative review of scientific evidence. *Journal of Ayurveda and Integrative Medicine*. 2019.
- [341] Zhao J, et al. Dietary protein and gut microbiota composition and function. *Current Protein & Peptide Science*. 2019.
- [342] Ahnen RT, et al. Carbohydrates. *Present Knowledge in Nutrition*. 2020.
- [343] Atzeni A, et al. Exercise, diet and stress as modulators of gut microbiota: implications for neurodegenerative diseases. *Neurobiology of Disease*. 2020.
- [344] Ahnen RT, et al. Carbohydrates. In: *Present Knowledge in Nutrition*. Elsevier. 2020.
- [345] Bonci L, et al. Diet strategies for managing chronic diarrhea. *International Foundation for Gastrointestinal Disorders*. 2020.
- [346] Cândido TLN, et al. Effects of dietary fat quality on metabolic endotoxaemia: a systematic review. *British Journal of Nutrition*. 2020.
- [347] Chou SW, et al. Dietary fibers in the treatment of constipation: a review of randomized controlled trials. *Nutrients*. 2020.
- [348] Chung WSF, et al. Relative abundance of the *Prevotella* genus within the human gut microbiota of elderly volunteers determines the inter-individual responses to dietary supplementation with wheat bran arabinosyl-oligosaccharides. *BMC Microbiology*. 2020.
- [349] Coombes JR, et al. Influence of dietary fat on gut microbiome composition and microbial metabolites. *Current Opinion in Clinical Nutrition and Metabolic Care*. 2020.
- [350] Davis CD, et al. Prebiotic dietary fiber modulates gut microbiota and metabolite profiles in prediabetic individuals. *Nutrients*. 2020.
- [351] Dionísio AP, et al. Effect of yacon syrup on blood lipid, glucose and metabolic endotoxaemia in healthy subjects: a randomized, double-blind, placebo-controlled pilot trial. *Food Science and Technology*. 2020.
- [352] Gubert C, et al. Exercise, diet and stress as modulators of gut microbiota: implications for neurodegenerative diseases. *Neurobiology of Disease*. 2020.
- [353] Gurwara S, et al. Alcohol use alters the colonic mucosa-associated gut microbiota in humans. *Nutrition Research*. 2020.
- [354] Hedström AK, et al. Low fish consumption is associated with a small increased risk of MS. *Neurology Neuroimmunology & Neuroinflammation*. 2020.
- [355] Hjorth MF, et al. Pretreatment *Prevotella*-to-*Bacteroides* ratio and salivary amylase gene copy number as prognostic markers for dietary weight loss. *The American Journal of Clinical Nutrition*. 2020.
- [356] Janczy A, et al. Impact of diet and synbiotics on selected gut bacteria and intestinal permeability in individuals with excess body weight – a prospective, randomized study. *Acta Biochimica Polonica*. 2020.
- [357] Labenz J, et al. Gastroösophageale Refluxkrankheit – update 2021. *Der Internist*. 2020.
- [358] Lee SH, et al. Emotional well-being and gut microbiome profiles by enterotype. *Scientific Reports*. 2020.
- [359] Machate DJ, et al. Fatty acid diets: Regulation of gut microbiota composition and obesity and its related metabolic dysbiosis. *International Journal of Molecular Sciences*. 2020.
- [360] Siminiuc R, Turcanu D. Certain aspects of nutritional security of people with gluten-related disorders, *Food and Nutrition Sciences*. 2020.
- [361] Thomsen BJ, et al. The potential uses of omega-3 fatty acids in dermatology: a review. *Journal of Cutaneous Medicine and Surgery*. 2020.
- [362] Yee BE, et al. Serum zinc levels and efficacy of zinc treatment in acne vulgaris: a systematic review and meta-analysis. *Dermatology Therapy*. 2020.
- [363] Zou H, et al. Effect of caloric restriction on BMI, gut microbiota, and blood amino acid levels in non-obese adults. *Nutrients*. 2020.
- [364] Die besten Hausmittel von A bis Z. *Alternative Heilmittel aus der Hausapotheke der Natur, inklusive der Heilmethoden der Homöopathie, Akupunktur und des Tai Chi*, Bassermann Verlag, 2020.
- [365] Beam A, et al. Effect of diet and dietary components on the composition of the gut microbiota. *Nutrients*. 2021.
- [366] Borsani B, et al. The role of carrageenan in inflammatory bowel diseases and allergic reactions: Where do we stand? *Nutrients*. 2021.
- [367] Clauss M, et al. Interplay between exercise and gut microbiome in the context of human health and performance. *Frontiers in Nutrition*. 2021.
- [368] Decker B, et al. Dietary fibers as prebiotics: mechanisms of action and health benefits. *Nutrients*. 2021.
- [369] Deshpande S, et al. Effect of dietary interventions on gut microbiota and their implications for health. *Molecules*. 2021.
- [370] Duffy M, et al. Gut microbiome, diet, and chronic disease. *Frontiers in Nutrition*. 2021.
- [371] Fachgesellschaft für Ernährungstherapie und Prävention (FET) eV. 2021.
- [372] Fu T, et al. Fermentation of alginate and its derivatives by different enterotypes of human gut microbiota: Towards personalized nutrition using enterotype-specific dietary fibers, *International Journal of Biological Macromolecules*. 2021.
- [373] Hahne D, et al. Dietary fiber and gut health. *Current Gastroenterology Reports*. 2021.
- [374] Hrubisko M, et al. Histamine intolerance—the more we know the less we know: A review. *Nutrients*. 2021.
- [375] Hosseini-Asl MK, et al. The effect of a short-term physical activity after meals on gastrointestinal symptoms in individuals with functional abdominal bloating: a randomized clinical trial. *Gastroenterology and Hepatology from Bed to Bench*. 2021.
- [376] Kolanos R, et al. German chamomile, Nutraceuticals. 2021.
- [377] Larson R, et al. Acacia gum is well tolerated while increasing satiety and lowering peak blood glucose response in healthy human subjects. *Nutrients*. 2021.
- [378] McQuilken SA, et al. Gut motility and its control, *Anaesthesia & Intensive Care Medicine*. 2021.
- [379] O'Brien L, et al. What are the pearls and pitfalls of the dietary management for chronic diarrhoea? *Nutrients*. 2021.
- [380] Pham VT, et al. Vitamins, the gut microbiome and gastrointestinal health in humans. *Nutrition Research*. 2021.
- [381] Podgórska A, et al. Acne vulgaris and intake of selected dietary nutrients—a summary of information. *Healthcare*. 2021.
- [382] Prasodanan PK, et al. Western and non-western gut microbiomes reveal new roles of *Prevotella* in carbohydrate metabolism and mouth–gut axis, *npj Biofilms and Microbiomes*. 2021.
- [383] Schnedl WJ, et al. Histamine intolerance originates in the gut. *Nutrients*. 2021.
- [384] Seo K, et al. The role of mucosal barriers in human gut health. *Archives of Pharmacological Research*. 2021.
- [385] Shil A, et al. Artificial sweeteners negatively regulate pathogenic characteristics of two model gut bacteria, *E. coli* and *E. faecalis*. *International Journal of Molecular Sciences*. 2021.
- [386] Srisukthaveerat V, et al. Nutrition communication about low FODMAP diet in irritable bowel syndrome (IBS) and small intestinal bacterial overgrowth (SIBO) in Thai healthcare practitioners. *Bioactive Compounds in Health and Disease*. 2021.
- [387] Sullivan VK, et al. Consumption of dried fruits is associated with greater intakes of underconsumed nutrients, higher total energy intakes, and better diet quality in US adults: a cross-sectional analysis of the National Health and Nutrition Examination Survey, 2007–2016. *Journal of the Academy of Nutrition and Dietetics*. 2021.
- [388] Wong A and Figueroa A. Effects of acute stretching exercise and training on heart rate variability: A review. *Journal of Strength and Conditioning Research*. 2021.
- [389] Watanabe-Asaka T, et al. From digestion and absorption to innate immunity and health care: Water and food intake may contribute to IL-22 in IL23-dependent mucosal immunity in the jejunum. *The Journal of Physiological Sciences*. 2021.
- [390] Atzeni A, et al. Association between ultra-processed food consumption and gut microbiota in senior subjects with overweight/obesity and metabolic syndrome. *Frontiers in Nutrition*. 2022.
- [391] Bartlett A, et al. Dietary protein and the intestinal microbiota: an understudied relationship. *iScience*. 2022.
- [392] Cataldi S, et al. The relationship between physical activity, physical exercise, and human gut microbiota in healthy and unhealthy subjects: A systematic review. *Biology*. 2022.
- [393] Chassaing B, et al. Randomized controlled-feeding study of dietary emulsifier carboxymethylcellulose reveals detrimental impacts on the gut microbiota and metabolome. *Gastroenterology*. 2022.
- [394] Choi Y, et al. A guide to dietary pattern–microbiome data integration. *The Journal of Nutrition*. 2022.
- [395] Conforti C, et al. Acne and diet: a review. *International Journal of Dermatology*. 2022.
- [396] Davis KF, et al. Prebiotics: what they are, health benefits and food sources. *Molecules*. 2022.
- [397] Galle A, et al. Dietary interventions for the management of patients with inflammatory bowel diseases: a systematic review. *Nutrients*. 2022.
- [398] Gaundal L, et al. Gut microbiota is associated with dietary intake and metabolic markers in healthy individuals. *Food & Nutrition Research*. 2022.
- [399] González M, et al. Effects of probiotic and prebiotic interventions on gut microbiota and immune response: a systematic review. *Nutrients*. 2022.
- [400] Gupta CC, et al. A time to rest, a time to dine: Sleep, time-restricted eating, and cardiometabolic health. *Nutrients*. 2022.
- [401] Hur HJ, et al. Beneficial effects of a low-glycemic diet on serum metabolites and gut microbiota in obese women with *Prevotella* and *Bacteroides* enterotypes: a randomized clinical trial. *Frontiers in Nutrition*. 2022.
- [402] Iao SI, et al. Associations between bedtime eating or drinking, sleep duration and wake after sleep onset: findings from the American time use survey. *British Journal of Nutrition*. 2022.
- [403] Kyaw TS, et al. Monosodium glutamate consumption reduces the renal excretion of trimethylamine N-oxide and the abundance of *Akkermansia muciniphila* in the gut. *Biochemical and Biophysical Research Communications*. 2022.
- [404] Lakshmanan AP, et al. Increased relative abundance of *Ruminococcus* is associated with reduced cardiovascular risk in an obese population. *Frontiers in Nutrition*. 2022.
- [405] Marques C, et al. Impact of beer and nonalcoholic beer consumption on the gut microbiota: a randomized, double-blind, controlled trial. *Journal of Agricultural and Food Chemistry*. 2022.
- [406] Moniaga CS, Tominaga M, Takamori K. An altered skin and gut microbiota are involved in the modulation of itch in atopic dermatitis. *Cells*. 2022.
- [407] Pattnaik H, et al. Nutritional elements in sleep. *Cureus*. 2022.
- [408] Phillips Michael M MD, et al. Abdominal bloating. *MedlinePlus Medical Encyclopedia*. 2022.
- [409] Sánchez-Pérez S, et al. Intestinal dysbiosis in patients with histamine intolerance. *Nutrients*. 2022.
- [410] Sanchez J, et al. Gastroesophageal reflux disease. *Interventional Management of Chronic Visceral Pain Syndromes*. 2022.
- [411] Yuanita L, et al. Profile of hemoglobin, glucose, and triglycerides on the use of yacon prebiotic syrup as a natural supplement. *RASAYAN Journal of Chemistry*. 2022.
- [412] Yuan MZ, et al. Research on the impact of regular exercise behavior of college students on academic stress and sleep quality during the COVID-19 pandemic. *Healthcare (Basel)*. 2022.
- [413] Abe A, et al. Partially hydrolyzed guar gum is associated with improvement in gut health, sleep, and motivation among healthy subjects. *Journal of Clinical Biochemistry and Nutrition*. 2023.
- [414] Abdi F, et al. Nutritional considerations in celiac disease and non-celiac gluten/wheat sensitivity. *Nutrients*. 2023.
- [415] Alasalvar C, et al. Dried fruits: bioactives, effects on gut microbiota, and possible health benefits—an update. *Nutrients*. 2023.
- [416] Aleman RS, et al. Leaky gut and the ingredients that help treat it: a review. *Molecules*. 2023.
- [417] AOK. Was sollte man bei Durchfall (Diarrhoe) essen und trinken? AOK Gesundheitsmagazin. 2023.
- [418] Atzeni A, et al. Carbohydrate quality, fecal microbiota and cardiometabolic health in older adults: a cohort study. *Gut Microbes*. 2023.
- [419] Barber C, et al. Metabolic response of intestinal microbiota to guar gum consumption. *Frontiers in Nutrition*. 2023.
- [420] Bartsch M, et al. Bridging the gap from enterotypes to personalized dietary recommendations: a metabolomics perspective on microbiome research. *Metabolites*. 2023.

- [421] Benameur T, et al. The effects of curcumin on inflammasome: latest update. *Molecules*. 2023.
- [422] Bielik V, et al. The effect of physical exercise and dairy probiotics (*Lactobacillus casei*) on gut microbiome in childhood cancer survivors. *Neoplasma*. 2023.
- [423] Carvalho RDOD, et al. Functional Swiss-type cheeses promote beneficial effects in mice gut microbiome during homeostasis and inflammation. *Food Bioscience*. 2023.
- [424] Conesa MPB, et al. Stabilizing histamine release in gut mast cells mitigates peripheral and central inflammation after stroke. *Journal of Neuroinflammation*. 2023.
- [425] Dicks L MT, et al. Our mental health is determined by an intrinsic interplay between the central nervous system, enteric nerves, and gut microbiota. *International Journal of Molecular Sciences*. 2023.
- [426] Dempsey KW, et al. Wheat-derived fructans as prebiotics. *Food Research International*. 2023.
- [427] De Souza Lopes A, et al. The impact of antimicrobial food additives and sweeteners on the growth and metabolite production of gut bacteria. *Folia Microbiologica*. 2023.
- [428] Dicks L MT, et al. Our mental health is determined by an intrinsic interplay between the central nervous system, enteric nerves, and gut microbiota. *International Journal of Molecular Sciences*. 2023.
- [429] Escobar LA, et al. The effect of soluble dietary fibers on gut microbiota: a systematic review and meta-analysis. *Frontiers in Nutrition*. 2023.
- [430] Fischer C, et al. Impact of dietary habits on gut microbiota and health: a systematic review. *Nutrients*. 2023.
- [431] Foshati S, et al. The effects of ginger supplementation on common gastrointestinal symptoms in patients with relapsing-remitting multiple sclerosis: A double-blind randomized placebo-controlled trial. *BMC Complementary Medicine and Therapies*. 2023.
- [432] Ghosh S, et al. Dietary polyphenols and their effects on gut microbiota in obesity: a review. *Food Chemistry*. 2023.
- [433] González-Morales J, et al. Prebiotic dietary fibers: a review of health benefits. *Nutrients*. 2023.
- [434] González-Orozco BD, et al. Metagenomic analysis and antibacterial activity of kefir microorganisms. *Journal of Food Science*. 2023.
- [435] González-Revuelta I, et al. Fermented foods as potential modulators of the gut microbiota: a review. *Nutrients*. 2023.
- [436] Gostimirovic M, et al. Resveratrol and gut microbiota synergy: Preventive and therapeutic effects. *International Journal of Molecular Sciences*. 2023.
- [437] Griffiths A, et al. Effects of resistant starch on gut microbiota: a systematic review. *Nutrients*. 2023.
- [438] Gudan A, et al. Small intestinal bacterial overgrowth and non-alcoholic fatty liver disease: What do we know in 2023? *Nutrients*. 2023.
- [439] Hald BJ, et al. The role of the gut microbiome in obesity: recent advances. *Nature Reviews Endocrinology*. 2023.
- [440] Harvard MS, et al. What to eat when you have chronic heartburn. *Harvard Health Publishing*. 2023.
- [441] Herdiana Y, et al. Functional food in relation to gastroesophageal reflux disease (GERD). *Nutrients*. 2023.
- [442] Isaakidis A, et al. Is there more to olive oil than healthy lipids? *Nutrients*. 2023.
- [443] Kanwal F, et al. The potential role of nondigestible raffinose family oligosaccharides as prebiotics. *Glycobiology*. 2023.
- [444] Li A, et al. Multi-omics analyses reveal relationships among polyphenol-rich oolong tea consumption, gut microbiota, and metabolic profile: a pilot study. *Food Chemistry*. 2023.
- [445] Li XY, et al. Regulation of gut microbiota by vitamin C, vitamin E and β -carotene. *Food Research International*. 2023.
- [446] Mitra S, et al. Brain modulation by the gut microbiota: from disease to therapy. *Journal of Advanced Research*. 2023.
- [447] Ogulur I, et al. Mechanisms of gut epithelial barrier impairment caused by food emulsifiers polysorbate 20 and polysorbate 80. *Allergy*. 2023.
- [448] Pang S, et al. Longevity of centenarians is reflected by the gut microbiome with youth-associated signatures. *Nature Aging*. 2023.
- [449] Poto R, et al. The role of gut microbiota and leaky gut in the pathogenesis of food allergy. *Nutrients*. 2023.
- [450] Radziszewska M, et al. Nutrition, physical activity and supplementation in irritable bowel syndrome. *Nutrients*. 2023.
- [451] Sánchez-Terrón G, et al. Impact of sustained fructose consumption on gastrointestinal function and health in Wistar rats: glycoxidative stress, impaired protein digestion, and shifted fecal microbiota. *Journal of Agricultural and Food Chemistry*. 2023.
- [452] Scarpellini E, et al. The use of peppermint oil in gastroenterology. *Current Pharmaceutical Design*. 2023.
- [453] Schnedl WJ, et al. A personalized management approach in disorders of the irritable bowel syndrome spectrum. *Clinical Nutrition ESPEN*. 2023.
- [454] Sharifan P, et al. Association of dietary and blood inflammatory indicators with depression, anxiety, and stress in adults with vitamin D deficiency. *International Journal of Geriatric Psychiatry*. 2023.
- [455] Shevchenko A, et al. Post-stress changes in the gut microbiome composition in rats with different levels of nervous system excitability. *PLOS ONE*. 2023.
- [456] Simão DO, et al. Lipids, gut microbiota, and the complex relationship with Alzheimer's disease: a narrative review. *Nutrients*. 2023.
- [457] Stolz R, et al. Evidenzbasierte naturheilkundliche Pflegeinterventionen in der Schmerztherapie. *Der Schmerz*. 2023.
- [458] Trivedi G, et al. Humming (simple bhramari pranayama) as a stress buster: A holter-based study to analyze heart rate variability (HRV) parameters during bhramari, physical activity, emotional stress, and sleep. *Cureus*. 2023.
- [459] Wang, Y, et al. Effect of two-week red beetroot juice consumption on modulation of gut microbiota in healthy human volunteers – A pilot study. *Food Chemistry*. 2023.
- [460] Zhang X, et al. Modulating a prebiotic food source influences inflammation and immune-regulating gut microbes and metabolites: insights from the BE GONE trial. *eBioMedicine*. 2023.
- [461] Zhao Q, et al. The relationship between the dietary inflammatory index (DII) and metabolic syndrome (MetS) in middle-aged and elderly individuals in the United States. *Nutrients*. 2023.
- [462] Zhong HJ, et al. Supplementation with high-GABA-producing *Lactobacillus plantarum* L5 ameliorates essential tremor triggered by decreased gut bacteria-derived GABA. *Translational Neurodegeneration*. 2023.
- [463] Aguayo-Guerrero JA, et al. Sucralose: from sweet success to metabolic controversies—unraveling the global health implications of a pervasive non-caloric artificial sweetener. *Life*. 2024.
- [464] Ardlsson Korat AV, et al. Dietary protein intake in midlife in relation to healthy aging – results from the prospective Nurses' Health Study cohort. *The American Journal of Clinical Nutrition*. 2024.
- [465] Bez NS, et al. Development of a diet quality score and adherence to the Swiss dietary recommendations for vegans. *Journal of Health, Population and Nutrition*. 2024.
- [466] Can G, et al. Unraveling the potential therapeutic effect of synbiotics in inflammatory bowel disease. *Journal of the Academy of Nutrition and Dietetics*. 2024.
- [467] Chatelan A, et al. Substituting low-calorie sweetened beverages for sugar-sweetened beverages to prevent obesity and cardiometabolic diseases: still a good idea? *Current Developments in Nutrition*. 2024.
- [468] Chen C, et al. *Lactobacillus paracasei* AH2 isolated from Chinese sourdough alleviated gluten-induced food allergy through modulating gut microbiota and promoting short-chain fatty acid accumulation in a BALB/c mouse model. *Journal of the Science of Food and Agriculture*. 2024.
- [469] Del Rosso J, et al. New insights into systemic drivers of inflammation and their contributions to the pathophysiology of acne. *Journal of Drugs in Dermatology*. 2024.
- [470] Hayer SS, et al. Antibiotic-induced gut dysbiosis elicits gut-brain axis relevant multi-omic signatures and behavioral and neuroendocrine changes in a nonhuman primate model. *Gut Microbes*. 2024.
- [471] Huang Y, et al. The adjuvant treatment role of ω -3 fatty acids by regulating gut microbiota positively in acne vulgaris. *Journal of Dermatological Treatment*. 2024.
- [472] Jamieson PE, et al. Gut enterotype-dependent modulation of gut microbiota and their metabolism in response to xanthohumol supplementation in healthy adults. *Gut Microbes*. 2024.
- [473] Konstanti P, et al. Physiology of γ -aminobutyric acid production by *Akkermansia muciniphila*. *Applied and Environmental Microbiology*. 2024.
- [474] Malta FAP, et al. A triple-masked, two-center, randomized parallel clinical trial to assess the superiority of eight weeks of grape seed flour supplementation against placebo for weight loss attenuation during perioperative period in patients with cachexia associated with colorectal cancer: a study protocol. *Frontiers in Endocrinology*. 2024.
- [475] Min L, et al. Effects of exercise on gut microbiota of adults: a systematic review and meta-analysis. *Nutrients*. 2024.
- [476] Mutoh N, et al. *Bifidobacterium breve* M-16V regulates the autonomic nervous system via the intestinal environment: A double-blind, placebo-controlled study. *Behavioural Brain Research*. 2024.
- [477] Palma-Ordóñez JF, et al. Implication of intestinal microbiota in the etiopathogenesis of fibromyalgia: a systematic review. *International Journal of Rheumatic Diseases*. 2024.
- [478] Pérez-Castillo IM, et al. The athlete gut microbiota: state of the art and practical guidance. *Beneficial Microbes*. 2024.
- [479] Pierdomenico M, et al. Anti-inflammatory effect of a pomegranate extract on LPS-stimulated HepG2 cells. *Natural Product Research*. 2024.
- [480] Prescott SL, et al. Nutritional criminology: Why the emerging research on ultra-processed food matters to health and justice. *International Journal of Environmental Research and Public Health*. 2024.
- [481] Weng J, et al. Gender differences in the association between healthy eating index-2015 and hypertension in the US population: evidence from NHANES 1999–2018. *BMC Public Health*. 2024.
- [482] WHO. Diarrhoea, WHO health topics. 2024.
- [483] Yadav SS, et al. Effect of yoga-based breathing practices on depression, anxiety, stress, and fear of COVID-19 positive hospitalized patients: A randomized controlled trial. *Journal of Ayurveda and Integrative Medicine*. 2024.