

H2S producing species

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|-----------------------------------|--------------------------------|-----------------------------------|--------------------------------------|
| <i>Acidaminococcus fermentans</i> | <i>Clostridium citroniae</i> | <i>Flavonifractor plautii</i> | <i>Peptococcus niger</i> |
| <i>Bilophila wadsworthia</i> | <i>Clostridium perfringens</i> | <i>Haemophilus parainfluenzae</i> | <i>Peptostreptococcus anaerobius</i> |
| <i>Blautia producta</i> | <i>Desulfovibrio spp.</i> | <i>Hafnia alvei</i> | <i>Proteus mirabilis</i> |
| CAG-791 | <i>Desulfovibrio piger</i> | <i>Hungatella hathewayi</i> | <i>Serratia liquefaciens</i> |
| <i>Citrobacter freundii</i> | <i>Enterobacter cloacae</i> | <i>Klebsiella pneumoniae</i> | |
| <i>Citrobacter werkmanii</i> | <i>Escherichia coli</i> | <i>Megasphaera elsdenii</i> | |

Succinate producing species

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|-------------------------------------|-------------------------------------|-------------------------------------|-----------------------------|
| <i>Akkermansia muciniphila</i> | <i>Bacteroides uniformis</i> | CAG-81 | <i>Paraprevotella clara</i> |
| <i>Alistipes onderdonkii</i> | <i>Bacteroides vulgatus</i> | <i>Corynebacterium spp.</i> | <i>Prevotella copri</i> |
| <i>Alistipes putredinis</i> | <i>Bifidobacterium adolescentis</i> | <i>Desulfovibrio fairfieldensis</i> | <i>Prevotella spp.</i> |
| <i>Alloprevotella rava</i> | <i>Bifidobacterium spp.</i> | <i>Escherichia coli</i> | UBA7173 sp |
| <i>Barnesiella intestinihominis</i> | <i>Bilophila wadsworthia</i> | <i>Odoribacter splanchnicus</i> | |
| <i>Barnesiella viscericola</i> | CAG-1031 | <i>Parabacteroides distasonis</i> | |

Ammonia producing species

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|-------------------------------|------------------------------------|-----------------------------------|-------------|
| <i>Anaerococcus prevotii</i> | <i>kerstersii</i> | <i>Pseudomonas putida</i> | UBA1191 sp |
| <i>Bifidobacterium longum</i> | <i>Desulfovibrio desulfuricans</i> | <i>Roseburia intestinalis</i> | UBA4224 sp. |
| <i>Bilophila wadsworthia</i> | <i>Enterobacter cloacae</i> | <i>Ruminococcus bicirculans</i> | |
| <i>Blautia producta</i> | <i>Escherichia fergusonii</i> | <i>Serratia liquifaciens</i> | |
| <i>Blautia wexlerae</i> | <i>Klebsiella pneumoniae</i> | <i>Streptococcus salivarius</i> | |
| CAG-485 spp. | <i>Kluyvera ascorbata</i> | <i>Streptococcus thermophilus</i> | |
| <i>Citrobacter freundii</i> | <i>Proteus mirabilis</i> | | |
| <i>Comamonas</i> | | | |

Histamine producing species

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|----------------------------------|--|
| <i>Bacteroides fragilis</i> | <i>Clostridium perfringens</i> |
| <i>Bacteroides nordii</i> | <i>Eggerthella lenta</i> |
| <i>Bacteroides oleiciplenus</i> | <i>Gordonibacter urolithinifaciens</i> |
| <i>Bacteroides salyersiae</i> | <i>Klebsiella aerogenes</i> |
| <i>Bacteroides sp2</i> | <i>Morganella morganii</i> |
| <i>Bacteroides stercorisoris</i> | <i>Plesiomonas shigelloides</i> |
| <i>Clostridium baratii</i> | <i>Raoultella ornithinolytica</i> |

GABA consuming species

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|--------------------------------------|------------------------------------|--------------------------------|
| <i>Acinetobacter pittii</i> | <i>Corynebacterium simulans</i> | <i>Megasphaera elsdenii</i> |
| <i>Anaerostipes hadrus</i> | <i>Desulfovibrio desulfuricans</i> | <i>Mitsuokella jalaludinii</i> |
| <i>Anaerotignum lactifermentans</i> | <i>Enterobacter cloacae</i> | UBA1191 sp |
| <i>Bifidobacterium dentium</i> | <i>Escherichia coli</i> | UBA5416 sp |
| <i>Brevibacterium ravenisurgense</i> | <i>Escherichia sp2</i> | |
| <i>Clostridioides difficile</i> | <i>Hafnia paralvei</i> | |
| <i>Corynebacterium aurimucosum</i> | <i>Klebsiella pneumoniae</i> | |
| | <i>Klebsiella variicola</i> | |
| | <i>Megamonas funiformis</i> | |

BCAA producing species

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|-------------------------------------|-----------------------------------|
| <i>Agathobacter rectalis</i> | <i>Blautia obeum</i> |
| <i>Akkermansia muciniphila</i> | CAG-65 sp |
| <i>Alistipes obesi</i> | CAG-81 sp |
| <i>Alistipes onderdonkii</i> | <i>Corynebacterium spp.</i> |
| <i>Anaerostipes caccae</i> | <i>Desulfovibrio spp.</i> |
| <i>Bacteroides uniformis</i> | <i>Dorea longicatena</i> |
| <i>Bacteroides vulgatus</i> | <i>Eggerthella lenta</i> |
| <i>Bacteroides spp.</i> | <i>Escherichia coli</i> |
| <i>Bifidobacterium adolescentis</i> | <i>Parabacteroides distasonis</i> |
| <i>Bifidobacterium spp.</i> | <i>Prevotella copri</i> |
| <i>Bilophila wadsworthia</i> | UBA4263 sp |

Hexa-LPS producing species

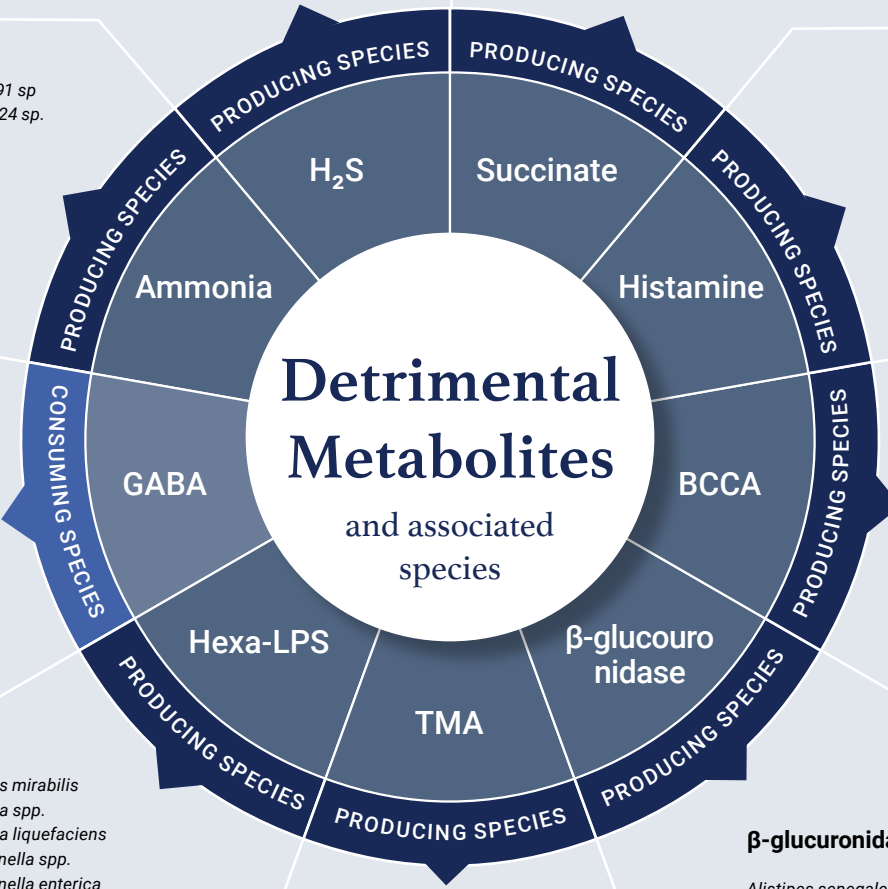
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| <i>Aeromonas spp.</i> | <i>Enterobacter cloacae</i> | <i>Proteus mirabilis</i> |
| <i>Citrobacter spp.</i> | <i>Hafnia spp.</i> | <i>Serratia spp.</i> |
| <i>Citrobacter freundii</i> | <i>Hafnia paralvei</i> | <i>Serratia liquefaciens</i> |
| <i>Escherichia spp.</i> | <i>Klebsiella spp.</i> | <i>Salmonella spp.</i> |
| <i>Escherichia coli</i> | <i>Klebsiella pneumoniae</i> | <i>Salmonella enterica</i> |
| <i>Enterobacter spp.</i> | <i>Proteus spp.</i> | <i>Vibrio spp.</i> |

β-glucuronidase producing species

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|-------------------------------------|---|----------------------------------|
| <i>Alistipes senegalensis</i> | <i>Coprobacter secundus</i> | <i>Lachnospita eligens</i> |
| <i>Alistipes shahii</i> | <i>Enorma massiliensis*</i> | <i>Prevotella ruminicola</i> |
| <i>Bacteroides uniformis</i> | <i>Escherichia coli</i> | <i>Roseburia hominis</i> |
| <i>Bacteroides intestinalis</i> | <i>Faecalibacterium prausnitzii [A,C]</i> | <i>Roseburia intestinalis</i> |
| <i>Bacteroides xylanisolvens</i> | <i>Fusicatenibacter saccharivorans</i> | <i>Subdoligranulum formicile</i> |
| <i>Bifidobacterium longum</i> | <i>Hungatella hathewayi</i> | UBA11524 sp1 |
| <i>Blautia producta</i> | | |
| <i>Clostridium clostridioformis</i> | | |

TMA producing species

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|----------------------------------|------------------------------------|---------------------------------|--------------------------|
| <i>Anaerococcus hydrogenalis</i> | <i>Collinsella tanakaei</i> | <i>Hungatella hathewayi</i> | <i>Peptococcus niger</i> |
| <i>Clostridium asparagiforme</i> | <i>Desulfovibrio desulfuricans</i> | <i>Klebsiella michiganensis</i> | <i>Proteus mirabilis</i> |
| <i>Clostridium citroniae</i> | <i>Enterobacter cloacae</i> | <i>Klebsiella oxytoca</i> | UBA1191 sp |
| <i>Clostridium sporogenes</i> | <i>Escherichia fergusonii</i> | <i>Klebsiella variicola</i> | UBA7185 sp |
| <i>Citrobacter freundii</i> | <i>Desulfovibrio desulfuricans</i> | <i>Kluyvera ascorbata</i> | |



The listed species are those most commonly observed by Microba in microbiome profiles. These lists are not exhaustive and rare unlisted species may also perform these functions (including novel organisms).

Propionate producing species

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|--------------------------------------|--------------------------------|-----------------------------------|--|
| <i>Akkermansia muciniphila</i> | <i>Bacteroides uniformis</i> | <i>Corynebacterium amycolatum</i> | <i>Phascolarctobacterium succinatutens</i> |
| <i>Alistipes obesi</i> | <i>Bacteroides spp.</i> | <i>Dialister invisus</i> | <i>Roseburia inulinivorans</i> |
| <i>Alistipes putredinis</i> | <i>Blautia obeum</i> | <i>Eubacterium hallii</i> | <i>Veillonella parvula</i> |
| <i>Bacteroides propionicifaciens</i> | <i>Coprococcus catus</i> | <i>Megasphaera elsdenii</i> | |
| <i>Bacteroides thetaiotamicron</i> | <i>Coprococcus eutactus</i> | | |
| | <i>Coprobacter fastidiosus</i> | | |

Butyrate producing species

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|------------------------------|-----------------------------------|---|---|
| <i>Agathobacter faecis</i> | <i>Anaerococcus hydrogenalis</i> | <i>Coprococcus catus</i> | <i>Intestinimonas butyriciproducens</i> |
| <i>Agathobacter rectalis</i> | <i>Anaerostipes caccae</i> | <i>Coprococcus comes</i> | <i>Roseburia hominis</i> |
| <i>Agathobacter spp.</i> | <i>Anaerostipes hadrus</i> | <i>Coprococcus eutactus</i> | <i>Roseburia intestinalis</i> |
| <i>Alistipes prausnitzii</i> | <i>Butyricoccus sp 1</i> | <i>Eubacterium hallii</i> | <i>Roseburia inulinivorans</i> |
| | <i>Butyricimonas synergistica</i> | <i>Faecalibacterium prausnitzii [C]</i> | <i>Subdoligranulum variabile</i> |
| | <i>Butyricimonas virosa</i> | | |

Oxalate degrading species

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|---------------------------------------|------------------------------------|
| <i>Acidaminococcus intestini</i> | <i>Escherichia coli</i> |
| <i>Bacillus coagulans</i> | <i>Eubacterium ramulus</i> |
| <i>Bacillus subtilis</i> | <i>Flavonifractor plautii</i> |
| <i>Bacillus spp.</i> | <i>Intestinimonas massiliensis</i> |
| <i>Bifidobacterium kashiwanohense</i> | <i>Klebsiella pneumoniae</i> |
| <i>Bifidobacterium longum</i> | <i>Megasphaera elsdenii</i> |
| <i>CAG-485 sp</i> | <i>Mitsuokella multacida</i> |
| <i>Citrobacter freundii</i> | <i>Oxalobacter formigenes</i> |
| <i>Clostridium citroniae</i> | <i>Streptococcus salivarius</i> |
| <i>Enterobacter cloacae</i> | <i>Streptococcus thermophilus</i> |

GABA producing species

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|------------------------------|-----------------------------------|
| <i>Alistipes finegoldii</i> | <i>angulatum</i> |
| <i>Alistipes inops</i> | <i>Bifidobacterium dentium</i> |
| <i>Alistipes putredinis</i> | <i>Escherichia coli</i> |
| <i>Bacteroides caccae</i> | <i>Hafnia paralvei</i> |
| <i>Bacteroides dorei</i> | <i>Klebsiella pneumoniae</i> |
| <i>Bacteroides fragilis</i> | <i>Odoribacter splanchnicus</i> |
| <i>Bacteroides ovatus</i> | <i>Parabacteroides distasonis</i> |
| <i>Bacteroides uniformis</i> | <i>Parabacteroides merdae</i> |
| <i>Bacteroides vulgatus</i> | <i>Parvimonas micra</i> |
| <i>Bifidobacterium</i> | |

Acetate producing species

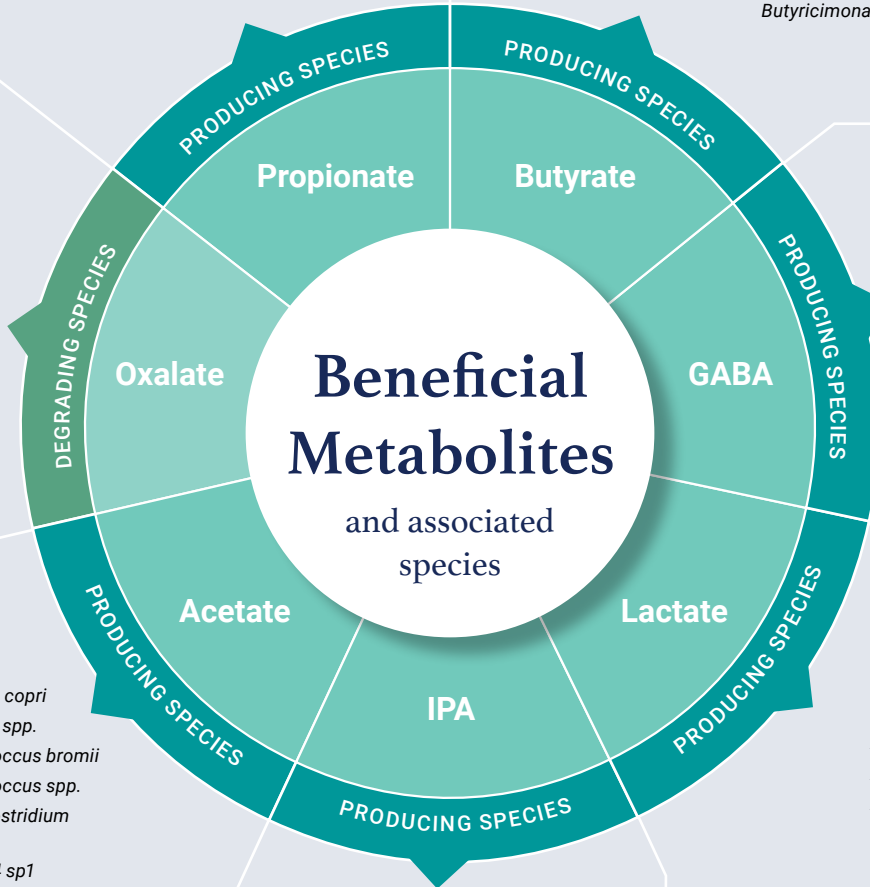
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| <i>Bifidobacterium spp.</i> | <i>Clostridium leptum</i> | <i>Prevotella copri</i> |
| <i>Bacteroides spp.</i> | <i>Coprococcus comes</i> | <i>Prevotella spp.</i> |
| <i>Bacteroides uniformis</i> | <i>Coprobacter fastidiosus</i> | <i>Ruminococcus bromii</i> |
| <i>Barnesiella intestinihomonis</i> | <i>Coprobacter secundus</i> | <i>Ruminococcus spp.</i> |
| <i>Blautia hansenii</i> | <i>Fusicatenibacter saccharivorans</i> | <i>Ruminiclostridium siraenum</i> |
| <i>Blautia obeum</i> | <i>Parabacteroides johnsonii</i> | <i>UBA11524 sp1</i> |

Lactate producing species

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|---|---|
| <i>Alistipes obesi (D)</i> | <i>Clostridium leptum (L)</i> |
| <i>Alistipes onderdonkii (D)</i> | <i>Collinsella aerofaciens (L)</i> |
| <i>Anaerostipes hadrus (L)</i> | <i>Collinsella spp. (D, L)</i> |
| <i>Bifidobacterium adolescentis (L)</i> | <i>Coprococcus comes (L)</i> |
| <i>Bifidobacterium spp. (L)</i> | <i>Fusicatenibacter saccharivorans (D, L)</i> |
| <i>Bacteroides dorei (D)</i> | <i>Holdemanella massiliensis (L)</i> |
| <i>Bacteroides intestinalis (D)</i> | <i>Lachnospira eligens (D, L)</i> |
| <i>Bacteroides uniformis (D)</i> | <i>Ruminococcus faecis (D, L)</i> |
| <i>Blautia obeum (D, L)</i> | <i>Subdoligranulum variabile (D)</i> |
| <i>Blautia wexlerae (D, L)</i> | |
| <i>Butyrivibrio crossotus (D, L)</i> | |

IPA producing species

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|-----------------------------------|------------------------------|----------------------------------|
| <i>Acidaminococcus intestini</i> | <i>Clostridium symbiosum</i> | <i>ER4 spp.</i> |
| <i>Acidaminococcus fermentans</i> | <i>CAG-81 spp.</i> | <i>Oscillibacter ruminantium</i> |
| <i>Clostridium sporogenes</i> | <i>D16 spp.</i> | <i>Peptoniphilus spp.</i> |

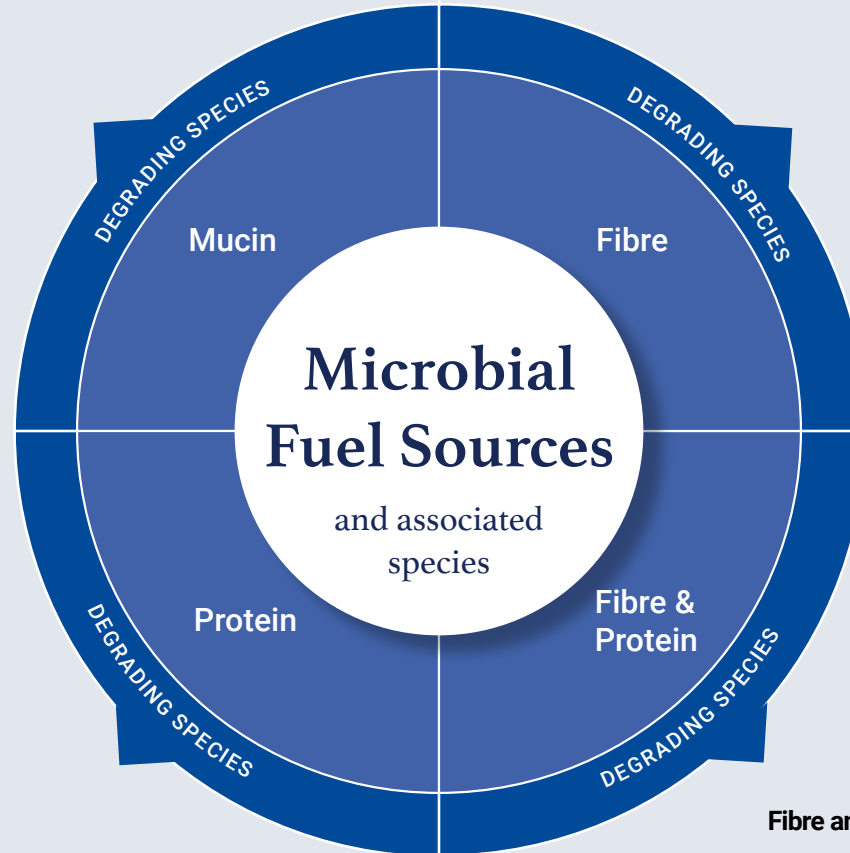


Mucin-degrading species

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|---------------------------------|-------------------------------------|
| <i>Akkermansia muciniphila</i> | <i>Barnesiella intestinihominis</i> |
| <i>Bacteroides caccae</i> | <i>Bifidobacterium bifidum</i> |
| <i>Bacteroides dorei</i> | <i>Bifidobacterium breve</i> |
| <i>Bacteroides eggerthii</i> | <i>Bifidobacterium longum</i> |
| <i>Bacteroides massiliensis</i> | <i>Clostridium perfringens</i> |
| <i>Bacteroides ovatus</i> | <i>Collinsella aerofaciens</i> |
| <i>Bacteroides plebeius</i> | <i>Collinsella intestinalis</i> |
| <i>Bacteroides vulgatus</i> | <i>Odoribacter splanchnicus</i> |
| <i>Bacteroides spp.</i> | |

Fibre-degrading species

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|------------------------------|---|----------------------------------|
| <i>Agathobacter faecis</i> | <i>Bacteroides cellulosilyticus</i> | <i>Roseburia inulinivorans</i> |
| <i>Agathobacter rectalis</i> | <i>Bacteroides intestinalis</i> | <i>Ruminococcus bicirculans</i> |
| <i>Alistipes prausnitzii</i> | <i>Coprococcus spp.</i> | <i>Ruminococcus bromii</i> |
| <i>Bifidobacterium spp.</i> | <i>Faecalibacterium prausnitzii [C]</i> | <i>Ruminoclostridium siraeum</i> |
| | <i>Fusicatenibacter saccharivorans</i> | <i>Subdoligranulum formicile</i> |
| | <i>Roseburia hominis</i> | <i>UBA11524 sp1</i> |
| | <i>Roseburia intestinalis</i> | |

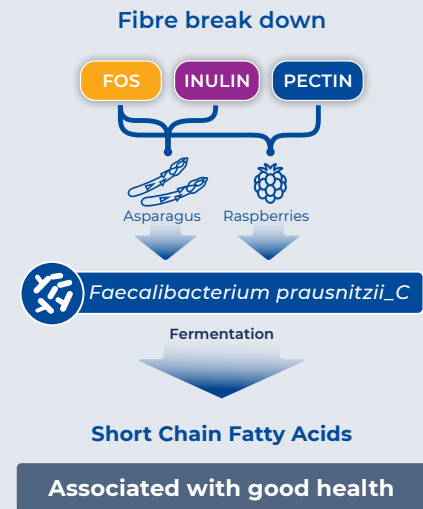


Protein / Mucin break down



Variety of metabolites:
BCAAs, Trimethylamine, Hydrogen sulphide, Ammonia, Histamine, GABA

Associated with poor health



Protein-degrading species

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|---------------------------------|------------------------------|----------------------------------|
| <i>Alistipes finegoldii</i> | <i>Bacteroides vulgatus</i> | <i>Parabacteroides merdae</i> |
| <i>Alistipes onderdonkii</i> | <i>Bilophila wadsworthia</i> | <i>Parvimonas micra</i> |
| <i>Alistipes putredinis</i> | <i>Blautia wexlerae</i> | <i>Peptostreptococcus spp.</i> |
| <i>Bacteroides caccae</i> | <i>Desulfovibrio spp.</i> | <i>Ruminococcus gnavus</i> |
| <i>Bacteroides dorei</i> | <i>Dorea formicigenerans</i> | <i>Ruminococcus torques</i> |
| <i>Bacteroides eggerthii</i> | <i>Eggerthella lenta</i> | <i>Sutterella wadsworthensis</i> |
| <i>Bacteroides massiliensis</i> | <i>Enterococcus faecalis</i> | |

Fibre and protein degrading species

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|-------------------------------------|-------------------------------------|-----------------------------------|
| <i>Alistipes shahii</i> | <i>Bacteroides thetaiotaomicron</i> | <i>Dorea longicatena</i> |
| <i>Alistipes senegalensis</i> | <i>Bacteroides uniformis</i> | <i>Lachnospira eligens</i> |
| <i>Bacteroides cellulosilyticus</i> | <i>Bacteroides vulgatus</i> | <i>Odoribacter splanchnicus</i> |
| <i>Bacteroides dorei</i> | <i>Blautia obeum</i> | <i>Parabacteroides distasonis</i> |
| <i>Bacteroides eggerthii</i> | <i>Collinsella aerofaciens</i> | <i>Paraprevotella clara</i> |
| <i>Bacteroides massiliensis</i> | <i>Coprobacter fastidiosus</i> | <i>Prevotella copri</i> |
| <i>Bacteroides ovatus</i> | <i>Coprococcus catus</i> | |
| <i>Bacteroides stercoris</i> | <i>Coprococcus comes</i> | |

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