

Supplementary Data

Table S1: Impact of animal-derived food groups on gut bacteria and associated health effects

Group	Food	Effect	Bacteria	Health	References	
Meat	White meat	+	<i>Holdemanella</i>	Data not available	(Lin et al. 2021) (Lang et al. 2018)	
		+	<i>Bacteroides</i>			
	Red meat		-	<i>Weissella</i>	Data not available	(Zhang et al. 2022) (Lin et al. 2021)
			+	<i>Escherichia</i>		
			+	<i>Coprobacillus</i>		
			+	<i>Shigella</i>		
			+	<i>Peptoniphilus</i>		
			+	<i>Bacteroides</i>	Inflammation lower anti-inflammatory responses increased incidence of type 2 diabetes	(Larsen et al. 2010; Karlsson et al. 2013)
			+	<i>Fusobacterium</i>		
			-	<i>Lactobacillus</i>		
			-	<i>Roseburia</i>		
			+	<i>Prevotella</i>	CVD risk	(Koeth et al. 2013)
			+	<i>Clostridium</i>	CRC with increase of β -glucuronidase activity	(Lee et al. 2022)
			+	Fusobacteria	CRC	(Shen et al. 2021)
			+	Proteobacteria		
			-	Firmicutes		
	-	Prevotellaceae				
	Meat diet		+	<i>Dorea</i>	Data not available	(Hess et al. 2018)
			+	Clostridia		
	Chicken-based diet		-	<i>Bacteroides</i>	Immunoglobulin downregulation in feces	(Zhao et al. 2022)
			-	Firmicutes		
			+	Proteobacteria	Data not available	
	The beef-based diet		+	Lachnospiraceae	Data not available	
			+	<i>Ruminococcus</i>		
	Whey-beef protein		0	<i>Roseburia</i>	Data not available	(Moreno-Pérez et al. 2018)
			-	<i>Bifidobacterium longum</i>		
			-	<i>Blautia</i>		
+			Bacteroidota			
Higher meat intake		-	<i>Anaerostipes</i>	Data not available	(Wang et al. 2023)	
		-	<i>Faecalibacterium</i>			
		+	<i>Roseburia</i>			
Fried meat		-	Lachnospiraceae	Changes in IGI and MIRI values and LPS, fibroblast growth factor 21(FGF21), and serum inflammatory factors (TNF- α , IL-1 β , and IL-10) levels	(Gao et al. 2021)	
		-	<i>Flavonifractor</i>			
		+	<i>Dialister</i>			
		+	<i>Dorea</i>			
		+	<i>Veillonella</i>			
Pork meat		+	<i>Bacteroides</i>	Data not available	(Shi et al. 2021)	
		+	<i>Dialister</i>			
		+	<i>Ruminococcus</i>			
		+	<i>Roseburia</i>			
		+	<i>Faecalibacterium</i>			

	Chicken meat	+	<i>Prevotella</i>	Increase the risk of skatole- and indole-induced diseases	(Shi et al. 2021)
		+	<i>Faecalibacterium</i>		
		+	<i>Megamonas</i>		
		+	<i>Dialister</i>		
	Cooked meat	+	<i>Coprobacter</i>		
Eggs	Eggs	+	<i>Bacteroides</i>	CRC individuals	(Shen et al. 2021)
		+	<i>Parabacteroides</i>	Heathy	
		+	Porphyromonadaceae	Improve child growth	(Suta et al. 2023)
		-	Prevotellaceae		
		+	<i>Bifidobacterium</i>	NM	(Suta et al. 2023)
		-	<i>Prevotella</i>	SCFA producer	(Suta et al. 2023)
		+	<i>Lachnospira</i>	Invasive cervical cancer	(Suta et al. 2023)
		-	<i>Varibaculum</i>		
Seafood	Cod	-	Bacteroidota	Postprandial glucose regulation	(Bratlie et al. 2021)
		+	Firmicutes		
	Salmon	-	Bacteroidota	Data not available	(Lopez-Santamarina et al. 2022)
		+	Firmicutes		
	Crustacean (Talitrus saltator)	+	<i>Bifidobacterium</i>	Beneficial effects on cardiovascular risk	(Balfegó et al. 2016)
		+	<i>Lactobacillus</i>		
		-	Firmicutes		
		-	Bacteroidota		
	Sardines	-	Firmicutes	Higher potency against High Fat Diet-induced Nonalcoholic fatty liver disease (NAFLD) and gut dysbiosis.	(Tian et al. 2016)
		-	Bacteroidota		
		+	<i>Escherichia coli</i>		
		+	<i>Bacteroides</i>		
	Fish oil	+	<i>Prevotella</i>	Enhanced the integrity of the intestinal epithelial cell barrier and ameliorated the metabolic dysfunction linked to obesity (Mice)	(Monk et al. 2019)
		+	<i>Escherichia</i>		
		+	<i>Akkermansia</i>		
	Menhaden fish oil	-	Bacteroidota	Reduce clinical colitis and colonic immunopathology	(Balfegó et al. 2016; Whiting, Bland, and Tarlton 2005; Andersen et al. 2011; Watson et al. 2018)
		-	Firmicutes		
		-	Bacteroidota		
		-	<i>Coprococcus</i>		
		+	<i>Faecalibacterium</i>		
		+	<i>Bifidobacterium</i>		
+		<i>Lachnospira</i>			
+		<i>Roseburia</i>			
-	<i>Lactobacillus</i>				
Squid ink polysaccharide	-	<i>Ruminococcus</i>	Protect against chemotherapy	(Lu et al. 2016)	
	-	<i>Bilophila</i>	Postprandial glucose regulation	(Bratlie et al. 2021)	
	-	<i>Oscillospira</i>			
	-	<i>Dorea</i>			
	-	<i>Mucispirillum</i>			
Dairy	Fermented milk product	+	<i>Bifidobacterium animalis</i>	Production of butyrate and others short chain fatty acids	(Veiga et al. 2014)

		+	<i>Streptococcus thermophilus</i>	(SCFA) Decreased the levels of the opportunistic pathogen, <i>Bilophila wadsworthia</i> . Improvement of Irritable Bowel Syndrome (IBS)	
		+	<i>Lactobacillus delbrueckii</i>		
		+	<i>Lactococcus lactis</i>		
		-	<i>Bilophila wadsworthia</i>		
		-	<i>Parabacteroides distasonis</i>		
Milk		+	<i>Flavonifractor</i>	HD modifies the abundance of specific butyrate-producing bacteria in Firmicutes and Verrucomicrobia in hyperinsulinemic individuals. the butyrate producing bacteria in Firmicutes phylum correlate negatively with insulin resistance. No effect on glycemic parameters,	(Khorraminezhad et al. 2021)
		+	<i>Faecalibacterium</i>		
		+	<i>Anaerotruncus</i>		
		+	Actinobacteria		
		+	Bifidobacteria		
		+	Lachnospiraceae		
		+	<i>Roseburia</i>		
		+	Proteobacteria		
		-	<i>Escherichia coli</i>		
		-	Enterobacteriaceae		
		-	Lentisphaerae		
		-	Verrucomicrobia		
		+	<i>Streptococcus</i>	The dairy-related gut microbial features are favorably associated with cardiometabolic risk factors, such as blood triglycerides and HDL cholesterol.	(Shuai et al. 2021)
		+	<i>Haemophilus</i>		
		+	<i>Bifidobacterium</i>		
		+	<i>Clostridium</i>		
		+	<i>Flavonifractor</i>	HD modifies the abundance of specific butyrate-producing bacteria in Firmicutes and Verrucomicrobia in hyperinsulinemic individuals. the butyrate producing bacteria in Firmicutes phylum correlate negatively with insulin resistance. No effect on glycemic parameters,	(Khorraminezhad et al. 2021)
		+	<i>Faecalibacterium</i>		
		+	<i>Anaerotruncus</i>		
		+	Actinobacteria		
		+	Bifidobacteria		
		+	Lachnospiraceae		
		+	<i>Roseburia</i>		
		+	Proteobacteria		
	-	<i>Escherichia coli</i>			
	-	Enterobacteriaceae			
	-	Lentisphaerae			
	-	Verrucomicrobia			
	+	Ruminococcaceae	Dairy- related gut microbiota may influence the host circulating metabolomics profile, contributing to the beneficial association of dairy intake with the cardiometabolic risk factors.	(Shuai et al. 2021)	
	+	<i>Lachnobacterium</i>			
	+	<i>Megasphaera</i>			
	+	Veillonellaceae			
Cheese,		+	<i>Flavonifractor</i>	HD modifies the abundance of specific butyrate-producing bacteria in Firmicutes and Verrucomicrobia in hyperinsulinemic individuals. the butyrate producing bacteria in Firmicutes phylum correlate negatively with insulin	(Khorraminezhad et al. 2021)
		+	<i>Faecalibacterium</i>		
		+	<i>Anaerotruncus</i>		
		+	Actinobacteria		
		+	Bifidobacteria		
		+	Lachnospiraceae		
		+	<i>Roseburia</i>		
		+	Proteobacteria		

		-	<i>Escherichia coli</i>	resistance. No effect on glycemic parameters,	
		-	Enterobacteriaceae		
		-	Lentisphaerae		
		-	Verrucomicrobia		
Kefir		+	<i>Flavonifractor</i>		
		+	<i>Faecalibacterium</i>		
		+	<i>Anaerotruncus</i>		
		+	Actinobacteria		
		+	Bifidobacteria		
		+	Lachnospiraceae		
		+	<i>Roseburia</i>		
		+	Proteobacteria		
		-	<i>Escherichia coli</i>		
		-	Enterobacteriaceae		
		-	Lentisphaerae		
		-	Verrucomicrobia		
Cream		+	<i>Flavonifractor</i>		
		+	<i>Faecalibacterium</i>		
		+	<i>Anaerotruncus</i>		
		+	Actinobacteria		
		+	Bifidobacteria		
		+	Lachnospiraceae		
		+	<i>Roseburia</i>		
		+	Proteobacteria		
		-	<i>Escherichia coli</i>		
		-	Enterobacteriaceae		
		-	Lentisphaerae		
		-	Verrucomicrobia		
Ice cream		+	<i>Flavonifractor</i>		
		+	<i>Faecalibacterium</i>		
		+	<i>Anaerotruncus</i>		
		+	Actinobacteria		
		+	Bifidobacteria		
		+	Lachnospiraceae		
		+	<i>Roseburia</i>		
		+	Proteobacteria		
		-	<i>Escherichia coli</i>		
		-	Enterobacteriaceae		
		-	Lentisphaerae		
		-	Verrucomicrobia		
Feta cheese		+	<i>Enterococcus faecium</i>	Low pH, presence of organic acids, and the bacteria profiles it-self, Improving the intestinal microbial ecosystem	(Vassos et al. 2009)
		+	<i>Enterococcus faecalis</i>		
		-	<i>Salmonella Typhi</i>		
		-	<i>Salmonella Typhimurium</i>		
		-	<i>Salmonella arizonae</i>		
		-	<i>Salmonella enteritidis</i>		
Goat cheese		+	<i>Enterococcus faecium</i>		
		+	<i>Enterococcus faecalis</i>		

		-	<i>Salmonella Typhi</i>		
		-	<i>Salmonella Typhimurium</i>		
		-	<i>Salmonella arizonae</i>		
		-	<i>Salmonella enteritidis</i>		
	Natural yogurt	+	<i>Akkermansia</i>	Direct association with LDL/HDL ratio values, serum CRP was significantly lower.	(González et al. 2019)
	Sugar yogurt	-	<i>Bacteroides</i>		
	Dairy diet	+	<i>Bifidobacterium</i>	Higher dairy consumption is prospectively associated with a higher gut microbiota a-diversity, The dairy-related gut microbial features are favorably associated with cardiometabolic risk factors, such as blood triglycerides and HDL cholesterol. Dairy-related gut microbiota may influence the host circulating metabolomics profile, contributing to the beneficial association of dairy intake with the cardiometabolic risk factors.	(Shuai et al. 2021)
		+	<i>Streptococcus</i>		
		+	<i>Clostridium</i>		
Honey	Honey	+	<i>Lactobacillus</i>	Increase weight and Head circumference increased	(Aly et al. 2017)
		+	<i>Bifidobacterium</i>		
		-	<i>Parvimonas</i>	Data not available	Li et al., (2020)
		-	<i>Enterococcus caccae</i>	Ameliorate cardiovascular diseases	Firmman et al., (2016)
		-	<i>Bifidobacterium catenulatum</i>		
		0	<i>Ruminococcus gnavreaii</i>		
		-	<i>Veillonella</i>	Data not available	Sachdev et al., (2021)
		-	<i>Clostridium</i>		
		-	<i>Staphylococcus</i>		
		-	<i>Proteus</i>		
		-	<i>Salmonella</i>	Promote healthy bowel function and reduce infection and inflammation	Schell et al., (2022)
		-	<i>Escherichia coli</i>		
		-	<i>Clostridiodes</i>		
		-	<i>Enterobacter</i>	Increase weight and Head circumference increased	(Aly et al. 2017)
		+	<i>Megamonas</i>	Data not available	(Jiang et al. 2020)
		+	<i>Streptococcus</i>		
-	<i>Prevotella</i>				
-	<i>Faecalibacterium</i>				
-	Lachnospiraceae incertae sedis				

(+): Beneficial, (-) potentially harmful, (0) Neutral effect.

Abbreviations:

CVD: Cardiovascular Disease

CRC: Colorectal Cancer

IGI: Insulinogenic Index
MIRI: Myocardial Ischemia-Reperfusion Injury
LPS: Lipopolysaccharides
FGF21: Fibroblast Growth Factor 21
TNF- α : Tumor Necrosis Factor Alpha
IL-1 β : Interleukin 1 Beta
IL-10: Interleukin 10
NM: Not Mentioned
SCFA: Short Chain Fatty Acids
IBS: Irritable Bowel Syndrome
HD: High Dairy
HDL: High-Density Lipoprotein
LDL: Low-Density Lipoprotein
CRP: C-Reactive Protein

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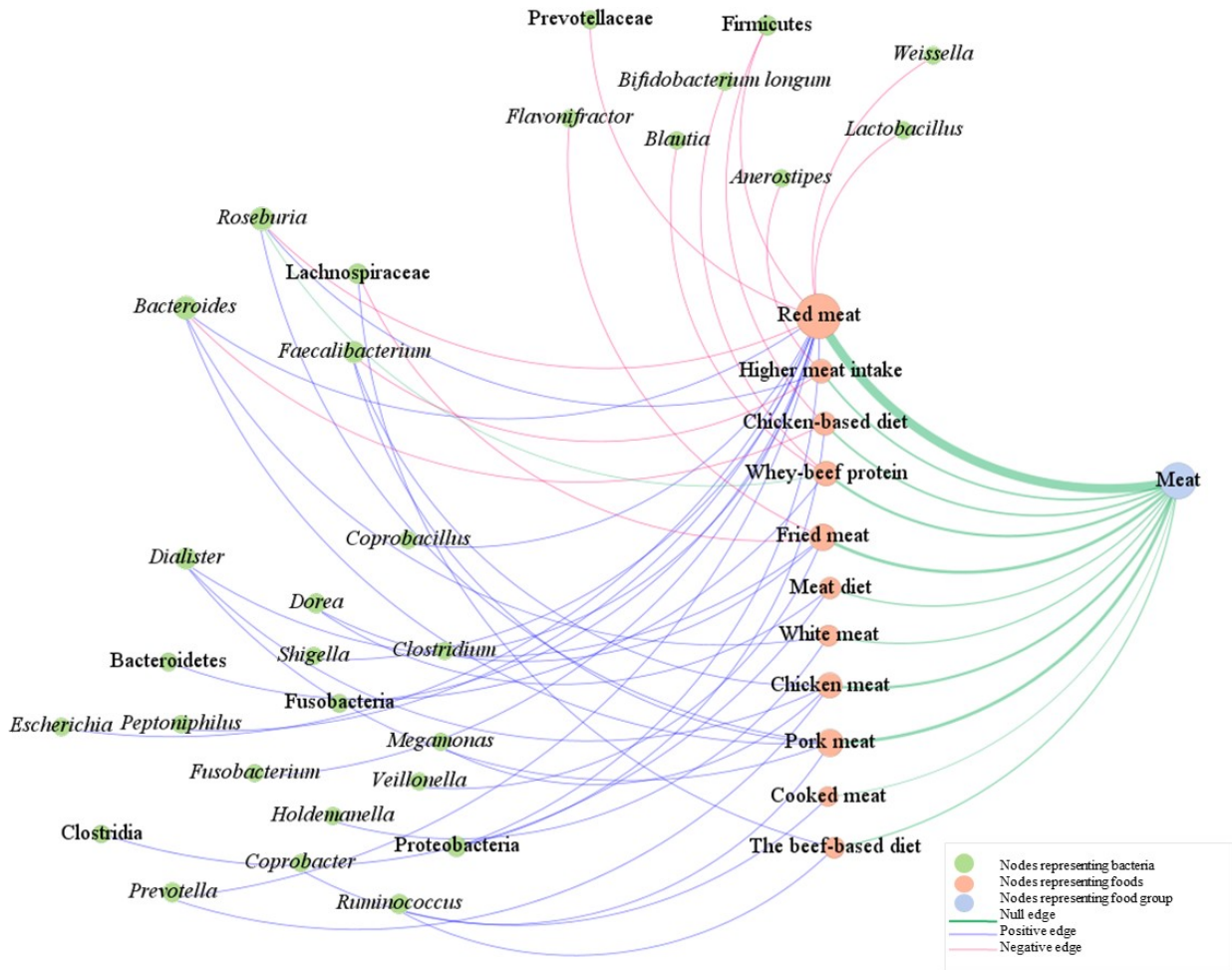


Fig. S1 : Graphical synthesis of reported associations between meat consumption (bold nodes) and gut bacterial taxa (standard nodes), constructed using Gephi (version 0.10.1). Green edges indicate positive associations (increased abundance), red/orange edges indicate negative associations (decreased abundance), and blue/grey edges indicate neutral effects. Node size reflects the number of reported associations.

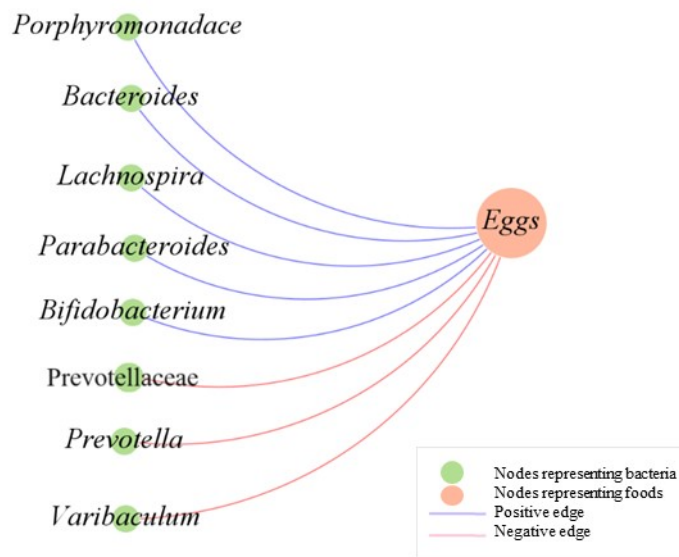


Fig. S2 : Graphical synthesis of reported associations between Eggs consumption (bold nodes) and gut bacterial taxa (standard nodes), constructed using Gephi (version 0.10.1). Green edges indicate positive associations (increased abundance), red/orange edges indicate negative associations (decreased abundance), and blue/grey edges indicate neutral effects. Node size reflects the number of reported associations.

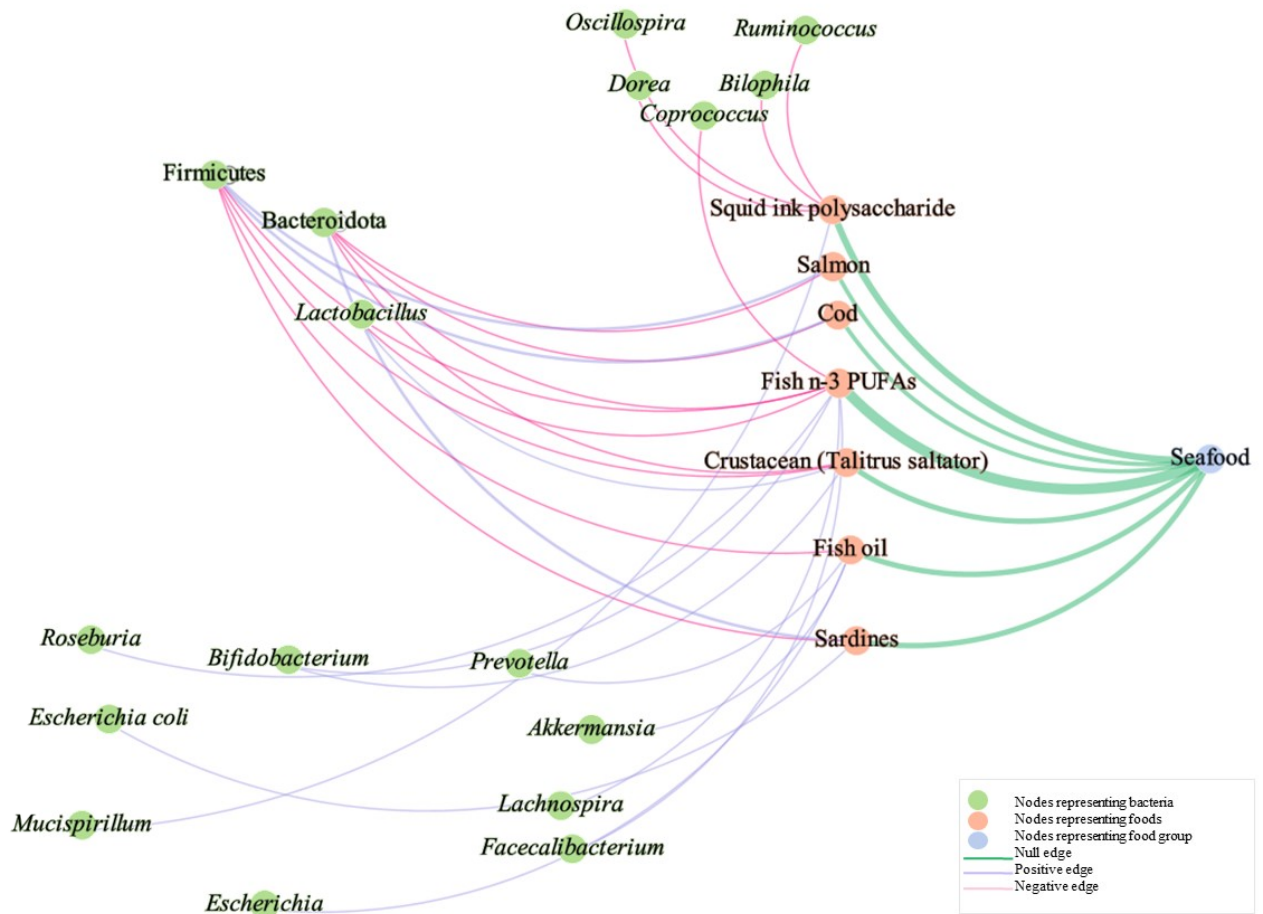


Fig. S3 : Graphical synthesis of reported associations between seafood consumption (bold nodes) and gut bacterial taxa (standard nodes), constructed using Gephi (version 0.10.1). Green edges indicate positive associations (increased abundance), red/orange edges indicate negative associations (decreased abundance), and blue/grey edges indicate neutral effects. Node size reflects the number of reported associations.

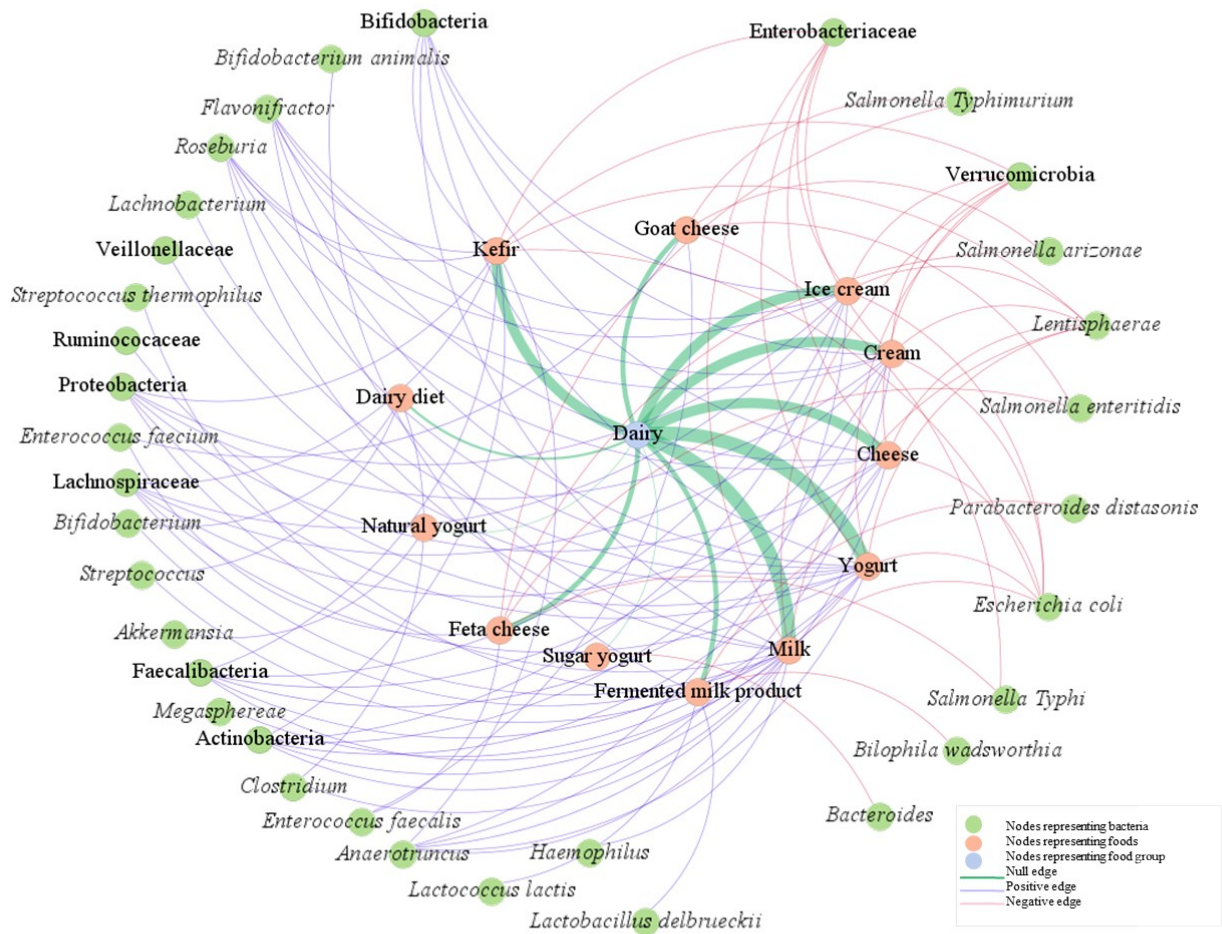


Fig.S4 : Graphical synthesis of reported associations between dairy consumption (bold nodes) and gut bacterial taxa (standard nodes), constructed using Gephi (version 0.10.1). Green edges indicate positive associations (increased abundance), red/orange edges indicate negative associations (decreased abundance), and blue/grey edges indicate neutral effects. Node size reflects the number of reported associations.