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Menopause and the Microbiome: Clinical Strategies for Restoring Digestive and Metabolic Health

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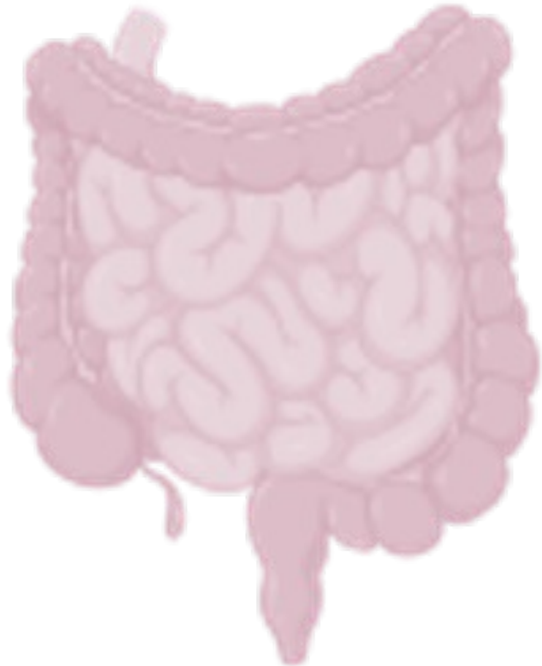
AGENDA

- Impact of hormonal decline
- Importance of the gut microbiome
- Key changes at Menopause
- Vaginal – Gut Axis
- The estrobolome
- Fibre, PHGG & Polyphenols
- Use of probiotics



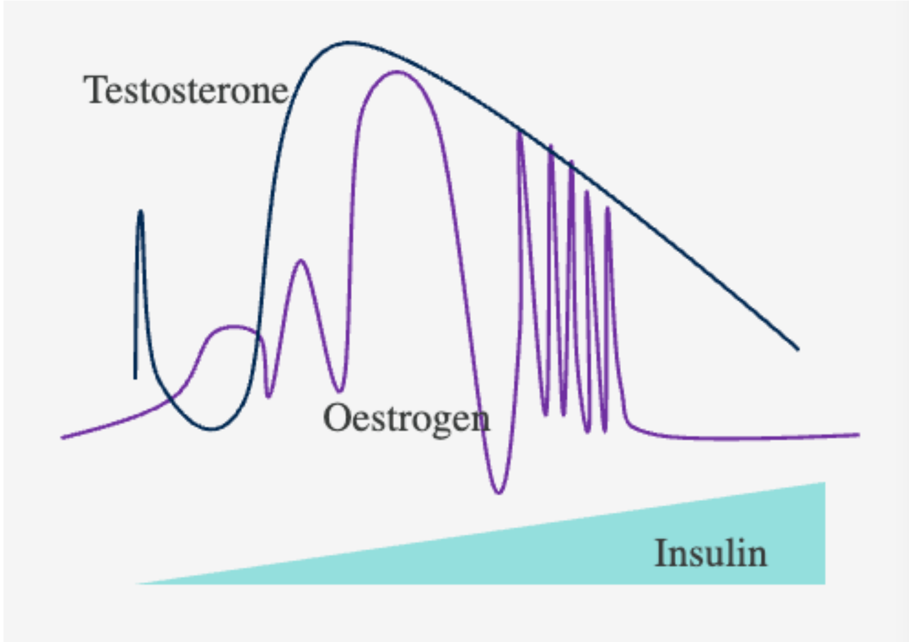
Impact of Hormone Decline

Oestradiol and progesterone are **systemic regulators**.

Receptors expressed throughout the body **including the gut**.

As they decline during menopause, **gut structure, function, and microbial balance are directly affected**.

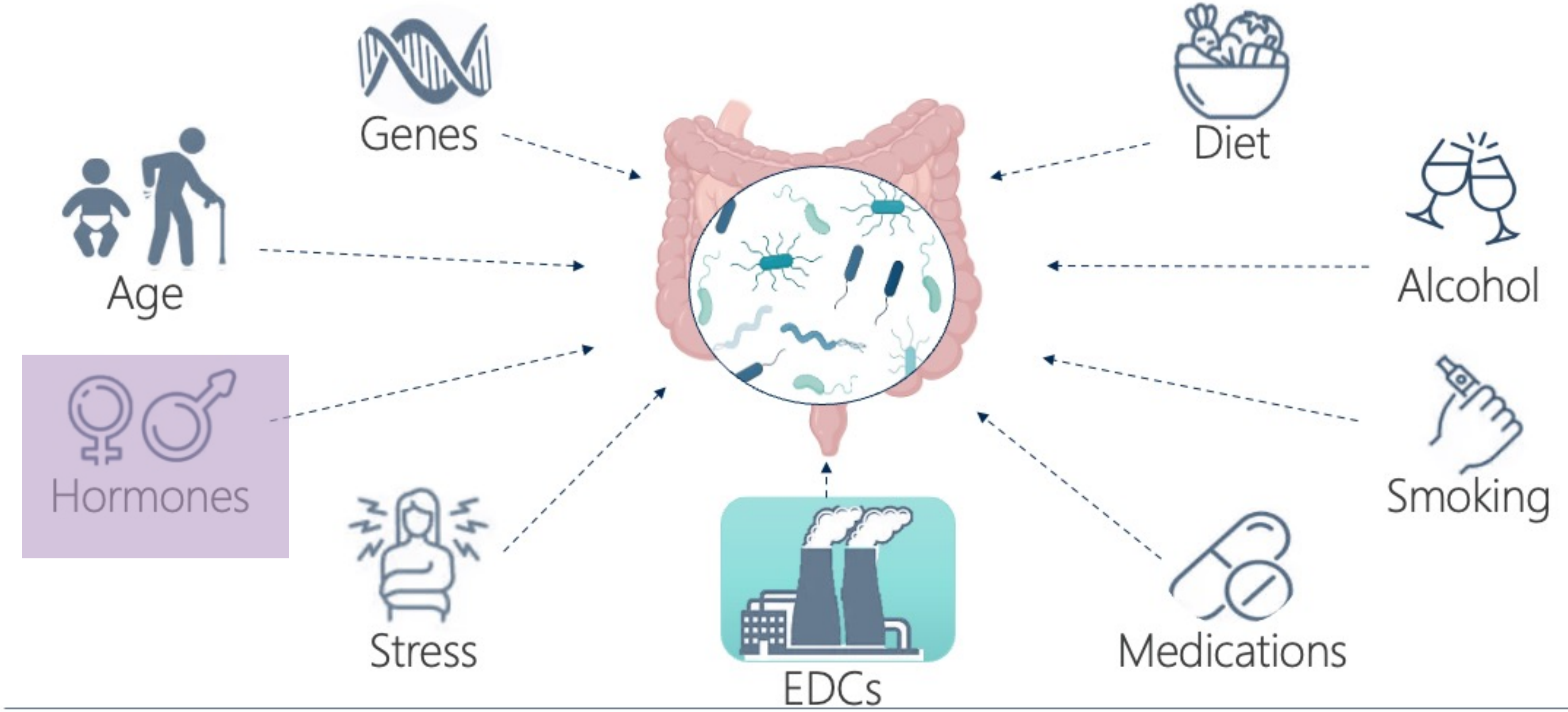
Because the gut influences immune, metabolic, and neuroendocrine systems, it becomes a **central mediator of whole-body health during menopause**.



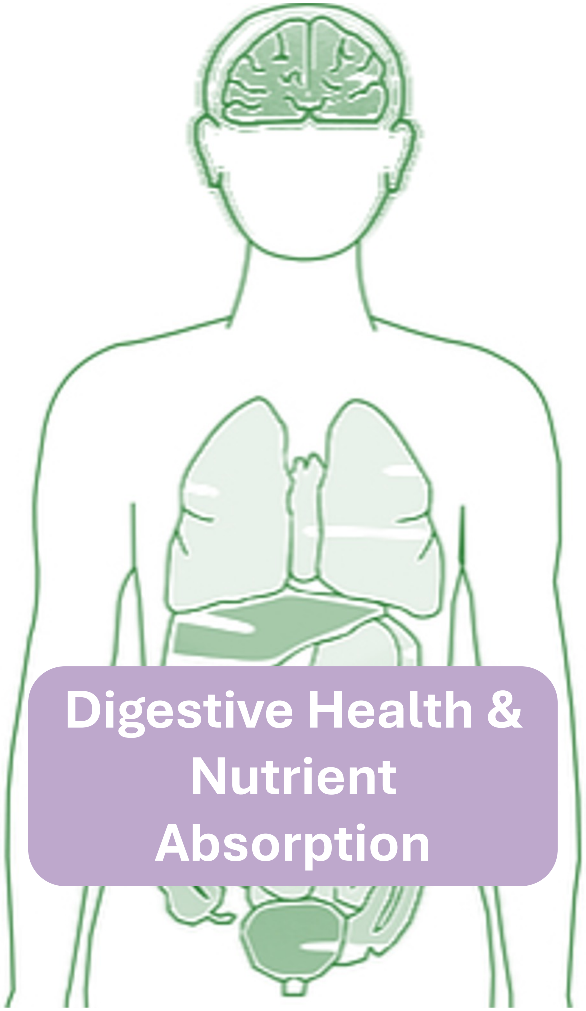
Gut changes may contribute to increased risk of metabolic, cardiovascular, and bone diseases in postmenopausal women. It may also contribute to cognitive and mood changes

https://www.sciencedirect.com/science/article/pii/S156816372500296X

Factors altering gut microbiota



Importance of the Gut Microbiome at Menopause



- Digestive Health & Nutrient Absorption
- Cardiometabolic Health, weight NAFLD
- Vaginal Health
- Gut-Skin Axis
  Oral Microbiome
- Bone- Gut Axis
  Gut-Muscle Axis
- Circadian Rhythm & Sleep Regulation
- Immune Modulation / inflammation
- Brain–gut communication
- Oestrogen Metabolism

Liu et al PLoS One. 2022 Feb 2;17(2):e0262855.
Yu et al. J. Genet. Genomics. 2025; 52(5):601-614
Gaber, et al. Microbiome 12, 192 (2024).
Baker. et al.. Maturitas, Volume 103, 45 - 53

Common Gut Symptoms at Menopause

- **Bloating / abdominal distension**
- **Constipation**
- **IBS symptoms**
- **Reflux**
- **Abdominal pain**
- **Incomplete evacuation**

DRIVEN BY →

Hormonal decline
Pelvic floor weakening (mechanical defecatory dysfunction)
Shift to The "M-Type" Microbiome
Microbial dysbiosis
Reduced SCFA production
Increased gut permeability
Altered serotonin signaling
Stress and sleep disruption

Hormone Decline & Age Influence: Diversity

AGE

- Overall diversity tends to plateau midlife
- Key compositional shifts begin (↓ Bifidobacterium, ↓ SCFA producers)
- Less resilience to stressors

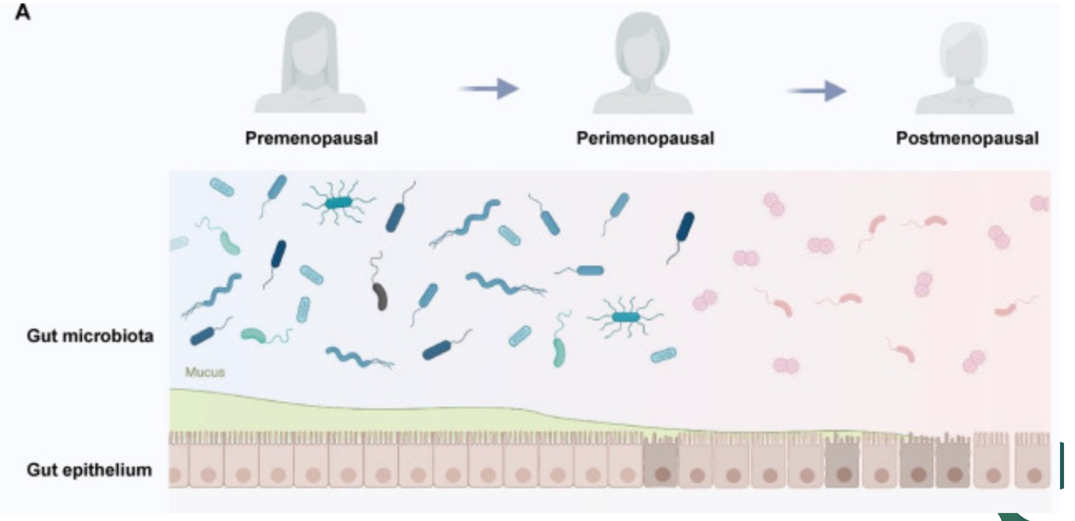
MENOPAUSE

- Reduced overall microbial richness
- Microbiome becomes more similar to male profile
- Reduced estrobolome potential
- Lower resilience to dietary and metabolic stress

Reduced **diversity** associated with insulin resistance, inflammation, cardiometabolic risk

Shift Toward a Pro-inflammatory Microbiome

↓ Lactobacillus, Bifidobacterium,
↓ Akkermansia muciniphila
↓ Faecalibacterium,
↑ Proteobacteria (in women with higher VAT)
Increased endotoxin load
Altered estrobolome activity
Disrupted bile acid signaling
Altered Firmicutes:Bacteroidetes ratio



Yu et al. J. Genet. Genomics. 2025; 52(5):601-614.

Peters Current Insights. Int J Womens Health. 2022 Aug 10;14:1059-1072.

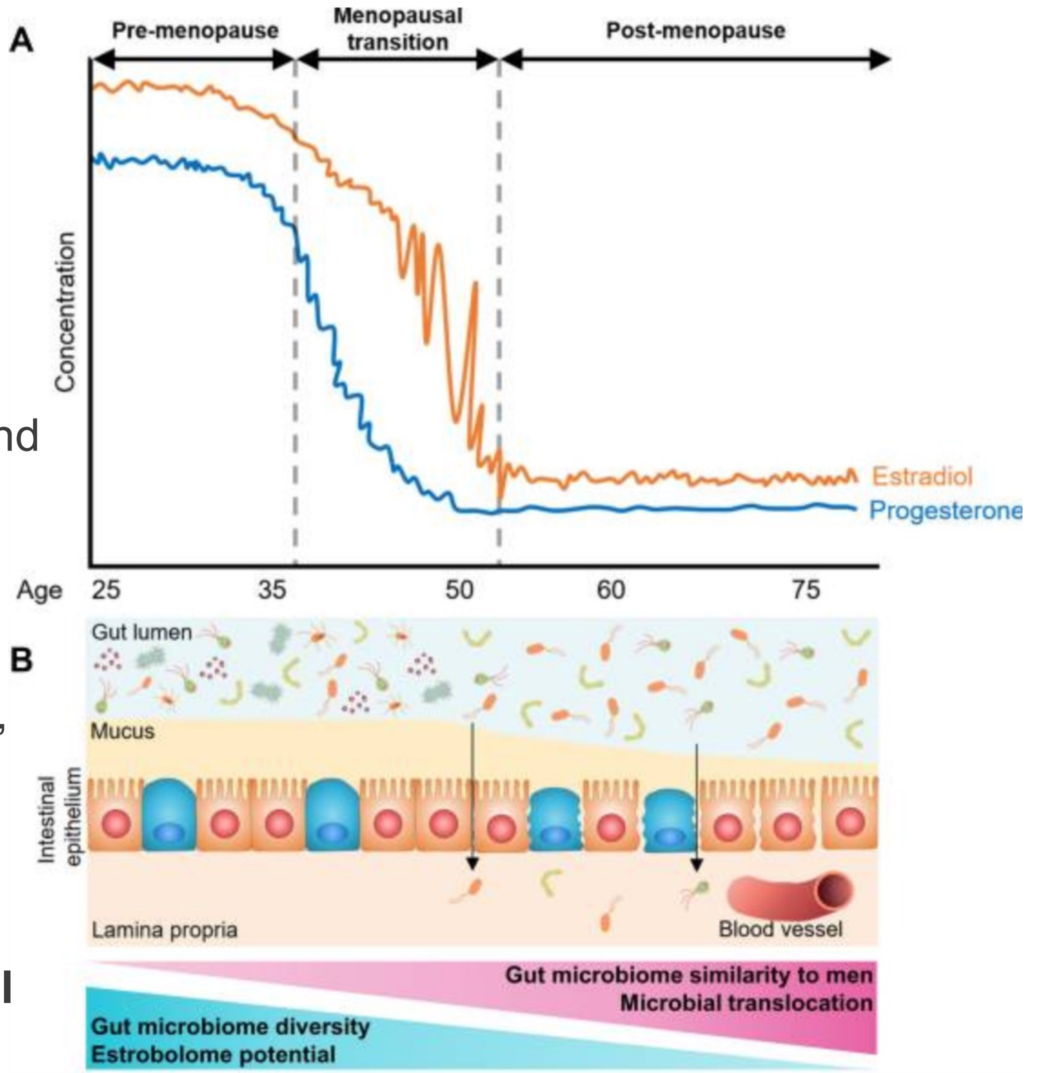
Gaber et al. Microbiome 2024

Reduced Barrier Integrity

Across the menopausal transition:
↑ Intestinal permeability
↑ Plasma IFABP (intestinal fatty acid binding protein – epithelial damage marker)
↑ LBP and sCD14 (markers of microbial translocation and immune activation)
↑ Circulating LPS (endotoxin)

The SWAN cohort data (Shieh et al.) showed that permeability **increases from pre- to post-menopause**, and is associated with:
Higher systemic inflammation (CRP)
Lower bone density

This suggests menopause is associated with **functional weakening of the epithelial barrier**.



Shieh et al JCI Insight. 2020 Jan 30;5(2):e134092
Peters et al. 2022 Int J Womens Health..

What Causes These Barrier Changes?

Loss of Sex Hormone Barrier Protection

Oestradiol / progesterone
Upregulate tight junction proteins
Stimulate mucin production
Enhance epithelial repair
Suppress NF-κB
Limit microbial translocation

This is a direct epithelial effect, independent of microbiome shifts.

Reduced SCFA (due to microbial shifts)

Butyrate increases:

- ✓ Occludin, claudins, ZO-1
- ✓ Enhances mucin (MUC2)
- ✓ Fuels colonocytes
- ✓ Suppresses NF-κB
- ✓ Promotes Tregs

Decline impacts barrier and inflammation

Secondary Amplifiers

- HPA axis activation (stress)
- Sleep/circadian disruption
- Visceral adiposity and endotoxemia
- Altered bile acid signaling
- Diet, alcohol, NSAIDs

SCFA & Systemic Impact

Butyrate acts via two mechanisms:
1. Local (gut barrier)
Tight junction, mucin, colonocyte energy, Treg induction, NF-κB suppression
2. Systemic signalling
GPR43 on L cells → ↓ GLP-1 & PYY release
GPR41/43/109A on immune cells & adipocytes → ↓ anti-inflammatory signalling
HDAC inhibition → epigenetic suppression of IL-6, TNF-α lost

↓ SCFA signalling contributes to:
Insulin resistance
Visceral adiposity
Bone resorption
Cardiometabolic risk
Sarcopenia risk (↓ mTOR/AMPK signalling)
The mechanism: LPS enters circulation → TLR4 activation → IL-6, TNF-α production

Shieh et al JCI Insight. 2020 Jan 30;5(2):e134092
Peters et al. 2022 Int J Womens Health..

Gut-Brain Axis: Tryptophan Metabolism & Menopause

Altered pathway	Symptoms
Altered serotonin signalling in gut	Altered motility — constipation or diarrhoea
↓ Serotonin in CNS	Low mood, poor sleep, fatigue
↑ Quinolinic acid → NMDA activation	Heightened pain sensitivity, central sensitisation
↑ Neuroinflammation	Cognitive fog, anxiety, poor concentration
↓ Melatonin (downstream of serotonin)	Sleep disturbance

CLINICAL SUPPORT

Reduce IDO activation: Omega-3, polyphenols, Mediterranean diet

Repair gut barrier *(removes IDO trigger):* Glutamine, zinc, vitamin D, curcumin, butyrate-producing fibres

Restore serotonin synthesis cofactors: B6, iron, magnesium, riboflavin (B2)

Support microbiome diversity (prebiotics, probiotics, plant diversity)
e.g Lactobacillus reuteri, Bifidobacterium infantis, Lactobacillus casei

Correia et al Int J Mol Sci. 2022 Jul 31;23(15):8493.
Chojnacki et al . Nutrients. 2023 Mar 3;15(5):1262.

Menopause, Metabolic Health, and the Gut Microbiome

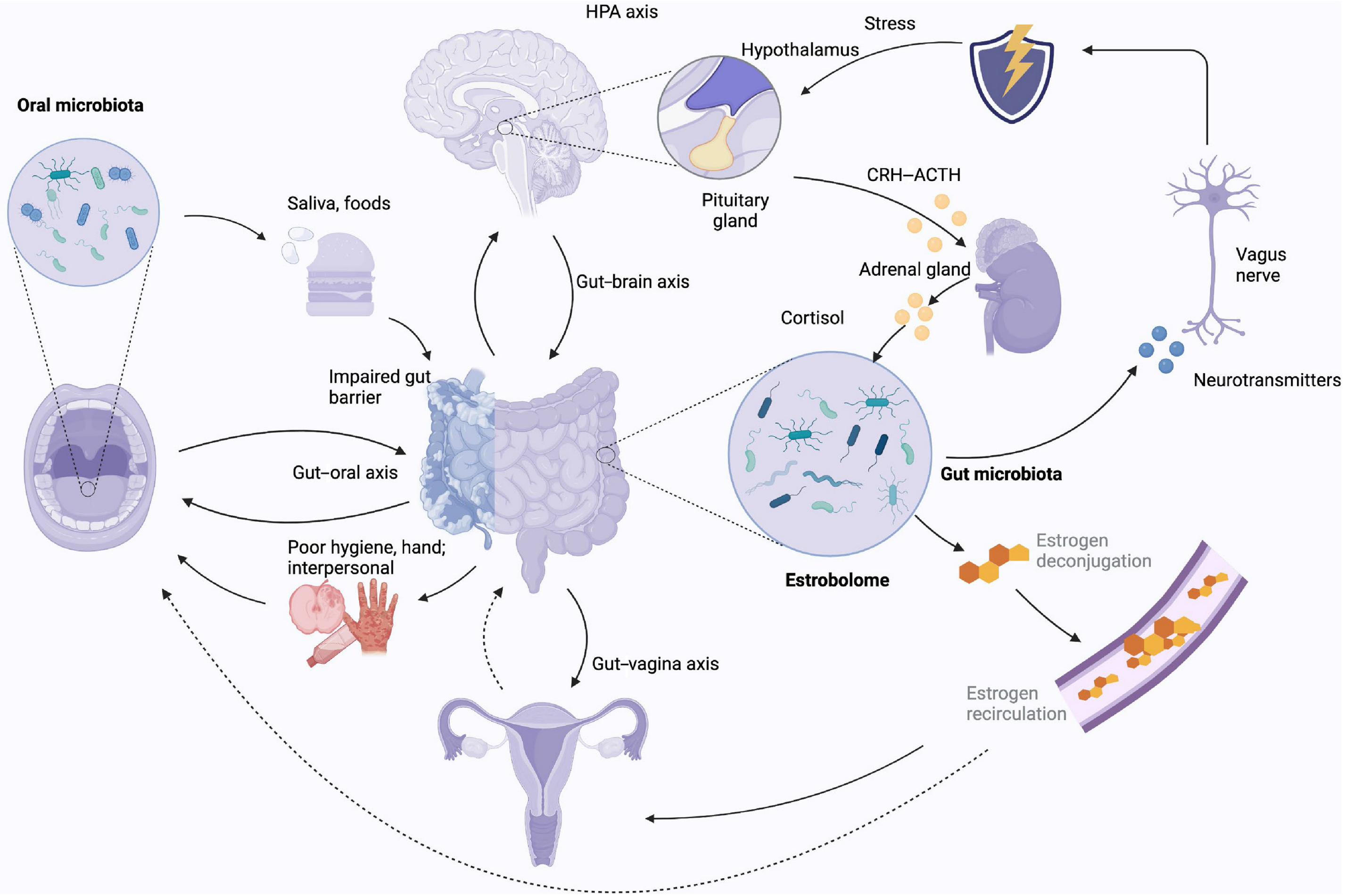
Gut microbiome shifts may **mediate or exacerbate** metabolic changes.

Gut Mechanism	Changes	Effect on Weight/Metabolism
Gut Permeability	Dysbiosis increases intestinal permeability	LPS endotoxins enter circulation → low-grade inflammation → visceral fat deposition; contributes to insulin resistance and metabolic syndrome
SCFA Production (Butyrate, Propionate, Acetate)	Reduced fiber fermentation → lower SCFAs	Impaired energy regulation, fat oxidation, appetite control; SCFAs regulate GLP-1, PYY, and other metabolic hormones
Inflammation / Metabolic Endotoxemia	Chronic low-grade inflammation from LPS	Insulin resistance, altered adipocyte function, visceral fat accumulation; amplifies metabolic risk during menopause
Microbial Diversity	Overall bacterial diversity decreases; loss of beneficial species (e.g., Faecalibacterium, Roseburia)	Lower SCFA production → impaired insulin sensitivity, reduced satiety signaling, altered energy balance; butyrate producers are key for metabolic health
Lifestyle & Age Interactions	Low fiber, sedentary lifestyle, aging immune system	Exacerbates dysbiosis and metabolic changes; modifiable factors can partially offset menopause-associated risk

Other contributory factors may include Gut-Brain Axis / Appetite Signalling, Bile Acid Metabolism and estrobolome activity

Becker SL, Manson JE. Menopause, the gut microbiome, and weight gain: correlation or causation? Menopause. 2020 Nov 23;28(3):327-331.

Microbiome axes during menopause



The microbiome axes between the gut and brain, between the gut and vagina, and between the gut and oral cavity show bidirectional interaction that can impact both distant and local locations and impact health and quality of life of menopausal women

Yu et al. J. Genet. Genomics. 2025; 52(5):601-614.

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Menopause-related changes in bile acid metabolism

⚠️ *Note: Mechanistic pathways largely inferred from metabolic disease literature; menopause-specific human RCT data remain limited.*

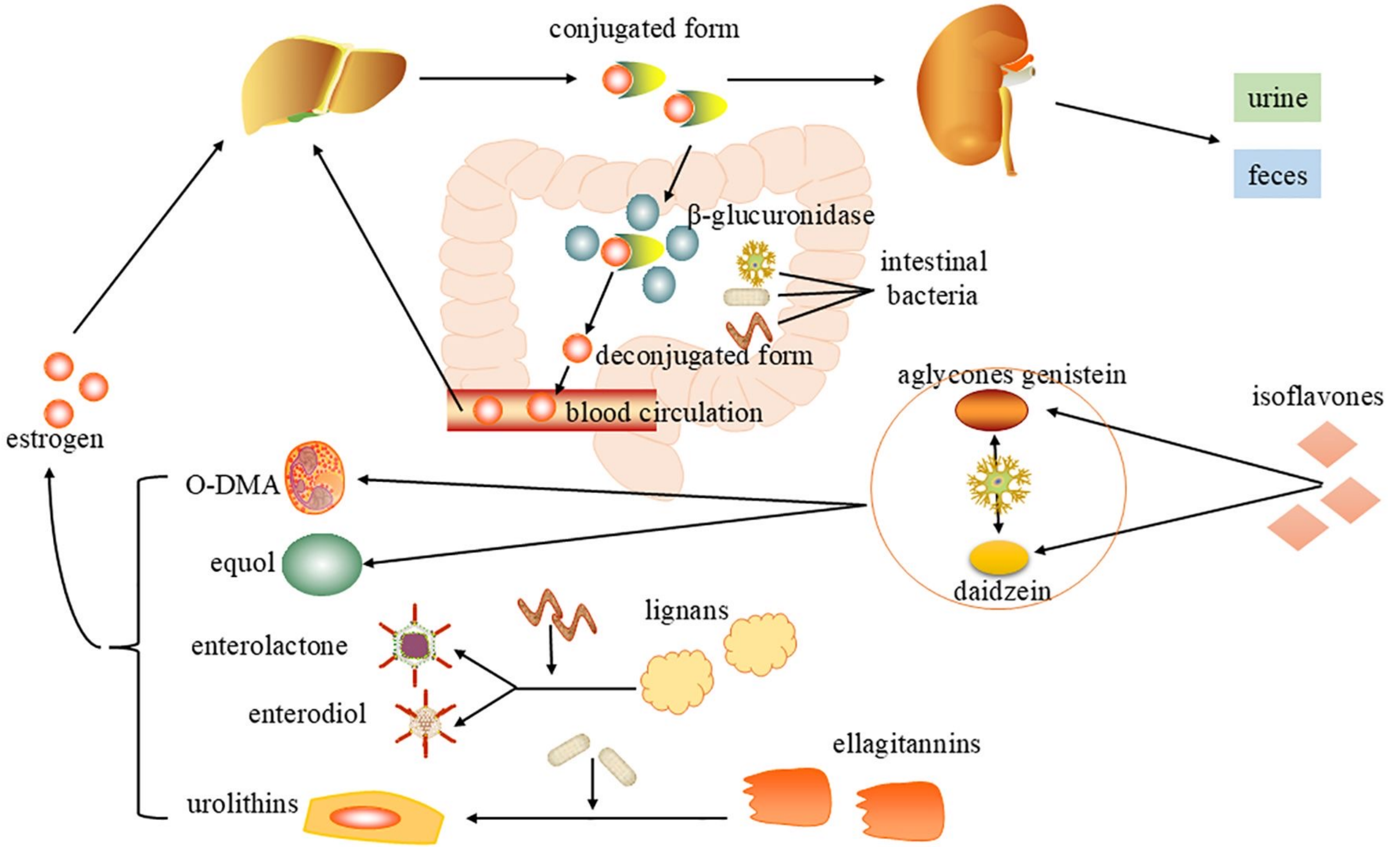
Change	What happens	Clinical consequence
Bile acid synthesis (liver)	Declining oestrogen impairs FXR/LXR/SHP signalling → reduced synthesis efficiency	↑ LDL cholesterol **Cardiovascular risk**
Primary → secondary conversion (gut)	Gut dysbiosis reduces microbial conversion of CA/CDCA → DCA/LCA	Irregular secondary bile acid availability → impaired metabolic + immune signalling **Glucose regulation**
FXR–FGF19 feedback loop	Reduced intestinal FXR activation → lower circulating FGF19	Weakened bile acid synthesis feedback; disrupted lipid + glucose metabolism **Metabolic liver disease**
TGR5 signalling	Fewer secondary bile acids (DCA, LCA) to activate TGR5	↓ Energy expenditure, ↓ thermogenesis, weakened NF-κB suppression (preclinical) **Inflammation · weight gain**
Bile acid conjugation	Pool shifts toward glycine-conjugated forms; fewer taurine-conjugated acids	Taurine-conjugated forms more effective at receptor signalling (emerging evidence) **Digestive symptoms**
Bone signalling (animal data only)	Reduced TGR5/FXR removes inhibitory signals on osteoclast activity	Accelerated bone loss post-menopause **Bone health**

Zu Y, Yang et al. Front Pharmacol. 2021;12:761256 | Zhao YX et al.. Clinics (Sao Paulo). 2020;75:e1486

The Estrobolome

The **estrobolome** refers to the **collection of gut microbial genes** (and the enzymes they encode) that are involved in **metabolizing oestrogens**, most notably through **β-glucuronidase (GUS) and sulfatase enzyme activity**.

These enzymes **deconjugate (reactivate)** oestrogen conjugates excreted into the gut, allowing them to be **reabsorbed back into circulation via enterohepatic recycling**, thereby influencing systemic oestrogen levels.



Wang et al Front. Endocrinol., 09 June 2025

The Menopause–Estrobolome Axis: A Breakdown in Recycling?

Menopause shifts the gut microbiome

Menopause is associated with reduced microbial diversity and altered estrobolome composition/function (Wang 2025).

Reduced oestrogen recycling

Lower β-glucuronidase activity associated with decreased deconjugation and enterohepatic recycling, increasing faecal oestrogen loss and potentially further lowering circulating levels.

The gut as a modifiable regulator

Estrobolome changes intersect with bone, metabolic, and inflammatory pathways - both insufficient and excessive GUS activity may be unfavourable

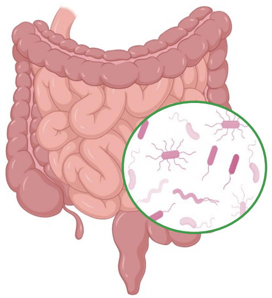
Clinical Goal: Support a balanced estrobolome via fibre diversity, polyphenols, and targeted probiotics to maintain physiological oestrogen recycling. Key strains with direct GUS/estrobolome evidence: Levilactobacillus brevis KABP052 (RCT data in peri/postmenopausal women); Lacticaseibacillus rhamnosus (selected strains show GUS activity in vitro).

Honda S et al. *J Med Food*. 2024;27(8):720–727.

Wang et al Front Endocrinol (Lausanne). 2025

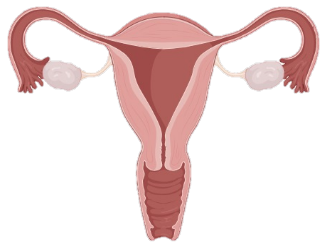
Gut-vaginal crosstalk

Probiotics for Vaginal Health: *L. rhamnosus* GR-1 & *L. reuteri* RC-14.



Hypoestrogenism

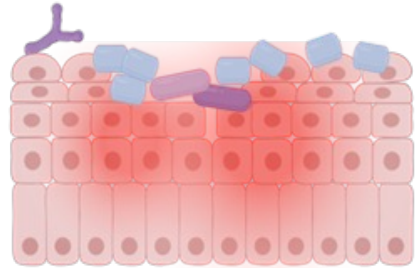
↓ microbial diversity
↑ dysbiosis
↑ inflammation
Gut barrier dysfunction
Reduced estrobolome



Vaginal ecosystem

Reduced Vaginal Glycogen.
↑ vaginal pH
↑ leukocyte infiltration
Atrophic Epithelium" (Thinning)

Genitourinary Syndrome of Menopause (GSM), increased susceptibility to Bacterial Vaginosis (BV) and UTIs



Dysbiosis

↓ *Lactobacillus* dominance
↑ Prevotella, Mycoplasma, Gardnerella

HRT – Vaginal Microbiome

HRT, especially Oestrogen, tends to restore vaginal microbiome "homeostasis."

Oestrogen (especially vaginal oestrogen):

- Restores glycogen
- Promotes Lactobacillus dominance
- **Reduces diversity back to a low-diversity, stable state**

In the vagina, **HRT-associated reduction in diversity is a therapeutic normalisation,** not dysbiosis.

Local (vaginal) oestrogen therapy has the strongest evidence for reversing dysbiosis and improving symptoms such as dryness and dyspareunia.
Systemic HRT also influences the vaginal microbiome, but local application usually achieves quicker and more pronounced microbial restoration.
Combining oestrogen with targeted probiotics (e.g., Lactobacillus crispatus, L. rhamnosus, L. reuteri) may improve outcomes

Lan Y, et al Menopause. 2024 Nov 1;31(11):1014-1023

Spurbeck et al . Future Microbiol. 2011 May;6(5):567-82.

HRT – Gut Microbiome

Altered microbial composition - Women using HRT exhibit **distinct gut microbial profiles** compared with non-users. Differences occur at the **community level**, rather than consistent changes in single taxa.

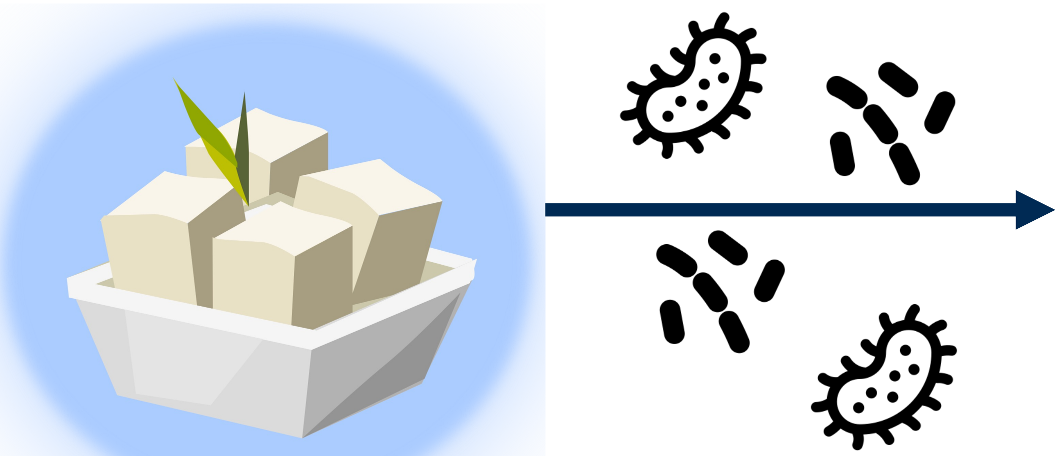
Increased or preserved microbial diversity - Several human studies report **higher α-diversity** in postmenopausal women on HRT. This suggests HRT may **preserve microbiome resilience** that otherwise declines with oestrogen loss. This may have implications body system wide e.g SCFA production and metabolic health

Premature Ovarian Insufficiency (POI)
HRT shows **stronger microbiome effects** than in natural menopause
Reduced gut dysbiosis
Improved microbial balance
Lower inflammatory, oxidative stress, and fibrotic biomarkers
Supports the concept that **earlier oestrogen loss has more profound gut consequences**, making HRT particularly critical.

James K.. Menopause 29(3):p 253-254, March 2022.
Jiang L, et al Front Endocrinol (Lausanne). 2021 Dec 23;12:794496.
Dothard et al Climacteric. 2023 Jun;26(3):182-192.

Understanding the Microbiome-Phytoestrogen Axis

Research increasingly describes phytoestrogens as "pro-drugs": inactive precursors that require a functional "gut bioreactor" to be unlocked.



Note: only 25–35% of Western women (and ~50% of Asian women) have the microbial machinery to produce Equol.

Diversity vs. Specificity: Whether isoflavones meaningfully reduce hot flashes depends largely on equol-producer status. Women whose microbiome converts daidzein into S-Equol respond substantially better; non-producers see only modest benefit. Microbial diversity is therefore the key variable.

Different types of phytoestrogen have different benefits, need specific microbes: dietary diversity and microbial diversity important

Multiple Benefits - Urolithin A (from pomegranate) and Enterolactone (from flax) aid hormone support and aid gut barrier support

Daily et al 2019

Phytoestrogens & the Microbiome

Category	Component	Microbial Action	Clinical Role in Menopause	Bacterial Players
The Estrobolome	**Endogenous oestrogen**	**Deconjugation:** Uses beta-glucuronidase to "unpack" and recycle remaining oestrogen.	**Modulates -** Prevents the steep "crash" of your own oestrogen.	Bacteroides: Escherichia coli: Clostridium:
Phytoestrogen Metabolism	**Isoflavones** (Soy, Red Clover)	Converts Daidzein into Equol (Potent ER beta agonist).	**Hot flashes and bone density benefit greatest in equol producers**	Adlercreutzia, Eggerthella, Asaccharobacter
Phytoestrogen Metabolism	**Lignans** (Flax, Sesame)	Converts plant precursors into **Enterolactone (ENL)**. Conversion requires a "consortium" of bacteria rather than a single species.	**Metabolic:** Associated with improved lipid profiles /reduced cardiovascular risk markers (largely observational evidence).	Bacteroides, Bifidobacterium, Eubacterium
Phytoestrogen Metabolism	**Ellagitannins** (Pomegranate, Walnuts)	Converts precursors into **Urolithin A.**	**Muscle Health** Improves mitochondrial health, may helps prevent **Sarcopenia**	Gordonibacter, Ellagibacter
Phytoestrogen Metabolism	**Coumestans** (Sprouts, Clover)	Mostly direct receptor binding with minimal conversion.	Bone Support highest ERβ affinity of dietary phytoestrogens; direct bone-building effects shown in preclinical studies	Minimal microbial processing

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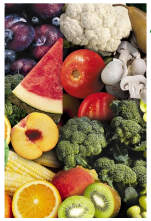
Barnard et al Menopause. 2023 Jan 1;30(1):80-87
Kuiper et al. *Endocrinology*. 1998;139(10):4252–63
Liu et al JAMA Netw Open. 2022 Jan 4;5(1):e2144279
Kahleova et al Maturitas. 2025 Sep;200:108661

Improving microbiome diversity and balance

Dietary diversity Mediterranean style, avoidance of additives, sweeteners etc



Increase fibre from plants: vegetables, fruits, seeds, nuts, wholegrains

Functional foods for motility - psyllium, kiwi fruit/ flaxseed / prunes

Omega 3 fatty acids & specific vitamins (e.g riboflavin)

Fermented foods

Probiotic, Fibre and Prebiotic Supplementation

Polyphenols

Multiple Roles of Fibre

Fibre isn't just for regularity; it supports microbial health, SCFA production, gut barrier function, is a substrate for beta-glucuronidase-producing bacteria and phytoestrogen-active microbes

Soluble Fibre: Oats, Beans, and Legumes. These help regulate transit time, supports blood glucose, lipid health and allows bacteria like *Adlercreutzia* more time to ferment isoflavones into Equol.

Resistant Starch: Cooked and cooled potatoes/rice and **green bananas**. Resistant starch increases ***Ruminococcus*** and ***Faecalibacterium prausnitzii***. Bifidobacterium species, supporting SCFA production, improving insulin sensitivity and lipid metabolism

Inulin-Rich Foods: Garlic, Onions, Asparagus, and Artichokes. These prebiotics selectively feed estrobolome-associated bacteria, promoting the beta-glucuronidase activity essential for recycling oestrogen and maintaining hormonal balance

Suriano F, et al. *Front Immunol*. 2022;13:953196. Wang et al. *Front Endocrinol* (Lausanne). 2025..

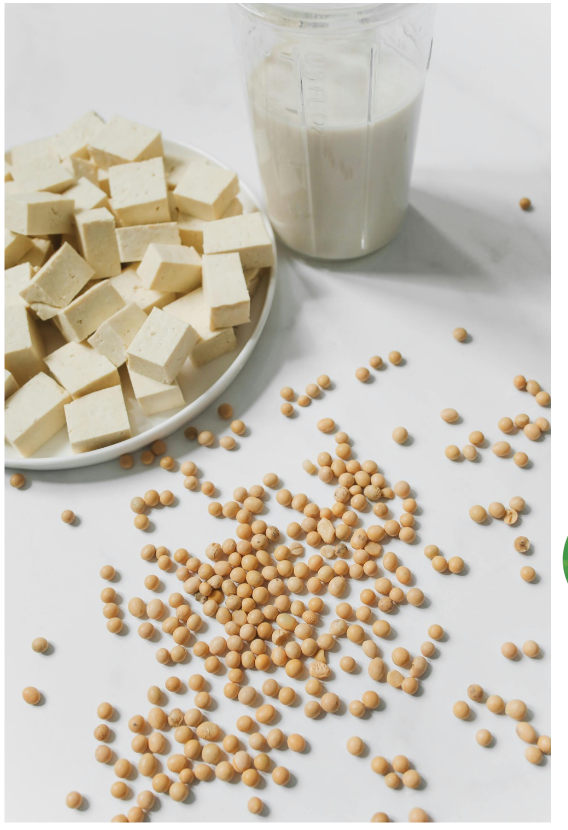
Plant Focused Diets

Switching to a plant-heavy diet (especially those rich in phytoestrogens) may have additional benefits via the gut microbiome at menopause

One RCT found a low-fat, vegan diet including cooked soybeans (½ cup [86g]/day) for 12 weeks reduced moderate-to-severe hot flashes by 88%, with 59% of women becoming completely free of moderate-to-severe hot flashes

Changes in Porphyromonas and Prevotella corporis correlated with hot flashes; changes in Clostridium asparagiforme correlated with changes in severe hot flashes.

Lower fat, high fibre diets: High saturated fat can decrease Akkermansia, whereas plant-based fibres increase it.



Kahleova et al Maturitas. 2023 Jun;172:32-38
Kahleova et al Complement Ther Med. 2023
Barnard et al 2023.

Prebiotic Fibres at Menopause

Selective feeding of estrobolome-associated bacteria to support oestrogen recycling

Butyrate production to maintain gut barrier integrity and reduce endotoxin load

Microbial diversity — which declines at menopause and is associated with insulin resistance and cardiometabolic risk

Prebiotic fibres support *Akkermansia muciniphila* abundance - enhancing mucin layer integrity and metabolic health

Examples of Prebiotic Fibres
Fructans (Inulin, FOS): Chicory root, onions, garlic, leeks
β-Glucans: Oats, barley, mushrooms
Galactomannans (incl. PHGG): Legumes, guar gum
Arabinogalactans / Arabinoxylans: Apples, pears, berries, whole grains
Xylooligosaccharides (XOS): Corn cobs, bamboo shoots

PHGG (Partially Hydrolysed Guar Gum):
A low-gas, well-tolerated galactomannan prebiotic with strong evidence in gut barrier support and functional gut symptoms.

Liaquat et al *Post Reprod Health*. 2025;31(2):105-114.

PHGG (Partially Hydrolysed Guar Gum)
Prebiotic fibre

Improves transit time, eases constipation, bloating, pain

Supports Immune function

Supplementation with a combination of probiotics, PHGG, and polyphenol-rich extracts significantly improved the quality of life in IBS patients via modulation of immune markers, increased beneficial SCFAs Wierzbicka et al 2025

production

Practical Advantage: Low-FODMAP and non-viscous; better tolerated than inulin for IBS. 5g daily. Addition of *Lactiplantibacillus plantarum* (Lpla33™) as in Ultraflora Fibre may improve motility and reduce abdominal bloating.

Edelman et al Appl. Microbiol. **2024**, *4*, 720-730
Rao et al Nutrition. 2019 Mar;59:158-169.

Polyphenols

Only 5–10% of polyphenols are absorbed in the small intestine. The remaining 90–95% reach the colon - transformed by microbes into active phenolic acids and stimulate SCFA production.

Strengthening the Intestinal Barrier

Balance estrobolome activity by enhancing microbial diversity

Metabolic Health & Lipid Metabolism (via AMPK Activation) Akkermansia Abundance

Modulation of Gut Microbiota Composition and SCFA production

Anti-inflammatory Neuroprotection Inhibit NF-kappa B

Facilitation of Phytoestrogen Conversion (e.g., Isoflavones to Equol)

Wilder-Smith et al Nutrients. 2023 May 20;15(10):2396

Meiners et al Front. Nutr. 12:1647740.
Rudrapal M, et al . 2026 Front. Pharmacol. 16:1710088.

Use of Probiotics – protective role at Menopause

- Inhibit visceral hypersensitivity
  Improve intestinal motor function
- Inhibit pathogenic bacteria
- Strengthen barrier function
- Regulate GI pH
- Regulate immunity / inflammation

- Metabolic Health
- Gut-Brain Health
- Vaginal Health
- Gut-Bone Axis
- Modulate the Estrobolome e.g L. brevis KABP052

Zhang J, et al. Medicine (Baltimore). 2020 Feb;99(7):e19107. doi: 10.1097/MD.0000000000019107

Honda et al. 2024

Use of Multi- strain formulas

Prediabetes + metabolic syndrome
Multi-strain Lactobacillus + Bifidobacterium blend
Intervention: 6g/day multi-species probiotic - 2 billion
Group with FOS added
12 & 24 weeks

Mechanisms Suggested
- Improved gut barrier function
- Reduced endotoxemia
- Modulation of gut microbiota composition
- Reduced systemic inflammation
- Improved short-chain fatty acid production

Key Outcomes (12 Weeks)
↓ Fasting glucose and improved HOMA-IR (greater effect with synbiotic)
↓ Triglycerides, ↑ HDL (modest total cholesterol change)
↓ Inflammatory markers (CRP trend)
Some participants no longer met metabolic syndrome criteria

Kassaian et al Diabetes Metab Syndr. 2019 Sep-Oct;13(5):2991-2996.

L. acidophilus NCFM® & B. lactis Bi-07®

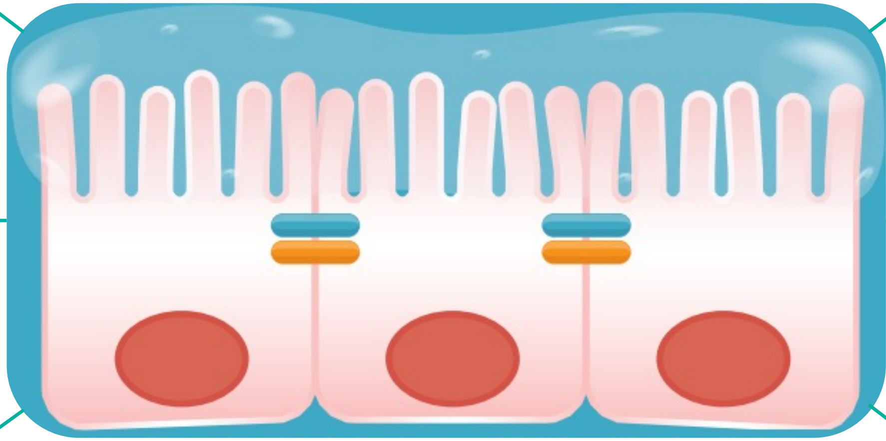
A well-researched strain combination with targeted mechanisms to support gut health and symptoms

Particularly useful visceral hypersensitivity and bloating

Demonstrated gastric survival - recoverable in stool post-administration

Strong epithelial adhesion properties

Boosts microbial diversity & increases SCFA production



Strengthens barrier integrity & promotes mucin synthesis

Inhibits pathogens & reduces LPS load

Anti-inflammatory — reduces IL-6 & TNF-α

Ringel-Kulka et al . J Clin Gastroenterol. 2011 Jul;45(6):518-25

Rousseaux et al. Nature Medicine February 200713(1):35-7 DOI:10.1038/nm1521

Ringel – Kulka et al Aliment Pharmacol Ther. 2014 Jul;40(2):200-7

Summary: Supporting the Menopausal Microbiome

Hormonal Impact: Menopause shifts the gut toward a pro-inflammatory state, directly increasing metabolic, bone, and cardiovascular risks.

Restore Microbial Diversity: Aim to increase diversity to counter the low-diversity, pro-inflammatory "M-type" profile seen in menopause - fibres, PHGG, high polyphenol intake (also helps reduce LPS metabolic endotoxemia and barrier health)

Support the Estrobolome: Use targeted fibres and probiotics to optimise oestrogen recycling and the conversion of isoflavones into Equol and Urolithin A.

Targeted Supplementation: Gut and Barrier: *L. acidophilus* NCFM & *B. lactis* Bi-07.

Vaginal Health: *L. rhamnosus* GR-1 & *L. reuteri* RC-14; **Prebiotic:** PHGG fibre to improve digestive symptoms, motility, and SCFA production.

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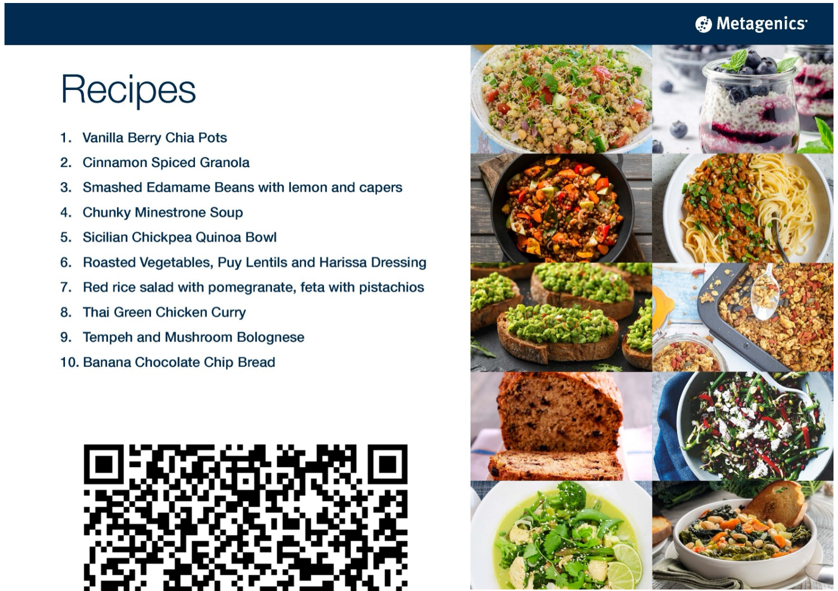
Integrative Approach: Combine microbiome-focused nutrition with stress management and sleep hygiene to mitigate the systemic impact of hormonal decline.

Key Products From Metagenics

- Ultraflora Fibre (PHGG)
- Ultraflora Complete for Women
- Ultraflora Complete
- Ultraflora Restore
- OmegaGenics High Strength
- Multi Essentials for Women 50+ Multivitamin



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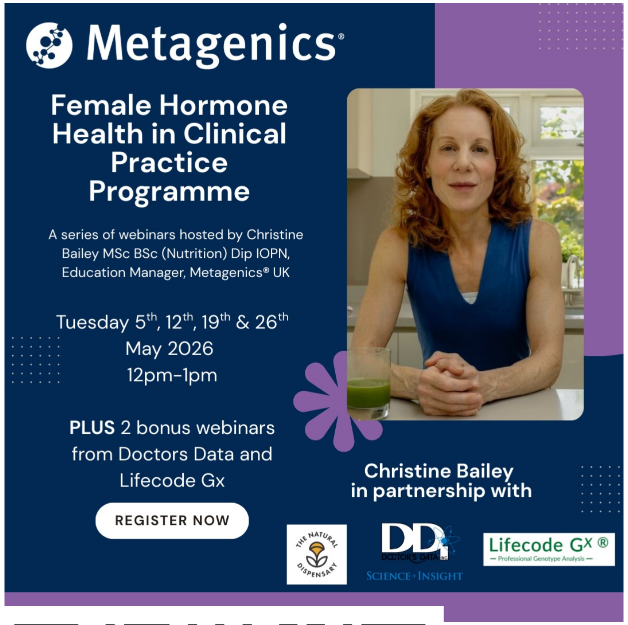
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