



# Femme

**Recover your  
intimate health**



## Femme

Patented synergistic probiotic complex designed to promote urovaginal health across women's life stages composed by *L. plantarum* - PBS067, *L. rhamnosus* - LRH020, *B. lactis* - BL050.

- ▶ Effective against vaginitis
- ▶ Proved vaginal colonization from oral intake
- ▶ Recovery from local inflammation



FINALIST  
**NUTRA**  
INGREDIENTS USA  
AWARDS 2025

WINNER  
**NUTRA**  
INGREDIENTS  
AWARDS 2024

FINALIST  
**NUTRA**  
INGREDIENTS USA  
AWARDS 2023

FINALIST  
**NUTRA**  
INGREDIENTS  
AWARDS 2023





# Microbiota & women's health

➤ 6 Community State Taxa groups based on the dominant specie:

<i>L. crispatus</i>	<i>L. iners</i>	Bifidobacteria
<i>L. gasseri</i>	<i>L. jensenii</i>	Dysbiotic without LAB

## EUBIOSIS OF VAGINAL MICROBIOTA 😊

- More than 90% are *Lactobacillus* spp.
- Acid pH guaranteed by lactic acid, SCFA, mucin and glycoprotein
- Production of bacteriocins with an antimicrobial activity
- Recently it has been observed that there is a community taxa enriched in *Bifidobacterium* species associated to healthy vaginal state.

## DYSBIOSIS OF VAGINAL MICROBIOTA ☹️

- Influenced by hormonal changes, pH and glycogen content.
- Reduced adhesion of LAB to epithelial cells & ease of proliferation of local gram-negative antagonists.
- Risk of migration and colonization by intestinal pathogens.



# Women's health

- Vaginal infections affect every year **300 Million women worldwide**
- 70% have experienced vaginal infections once in their life
- 10% of them have frequent relapses

*Bacterial  
vaginosis  
(anaerobic)*

Prevalence:  
**30%**  
> **50%** of them  
are recurrent

*Yeast  
vaginitis*

**3 in 4 women**  
experience at  
least one  
episode

*Aerobic  
vaginitis*

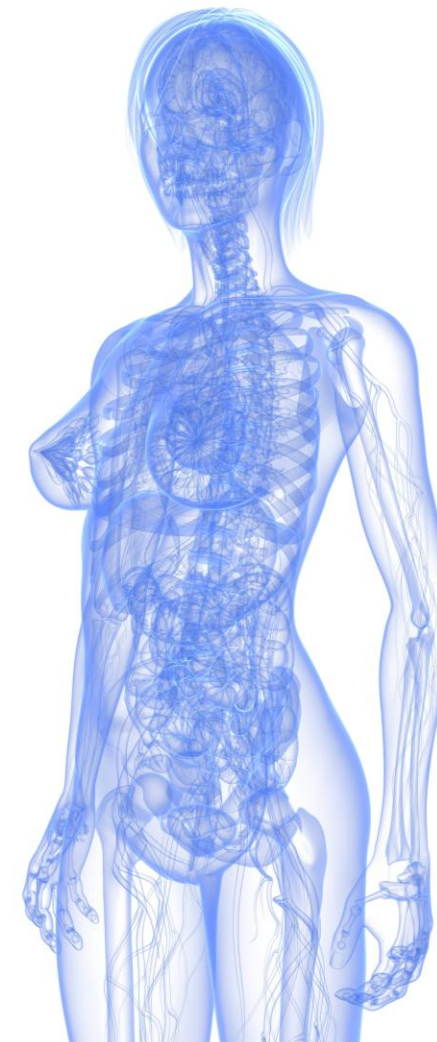
Prevalence:  
from **5** to  
**10.5 %**

*Urinary  
infections  
(cystitis)*

**1 in 3 women**  
have had at  
least 1 episode  
before 24 y.o.

# Vaginal healthy microbiota

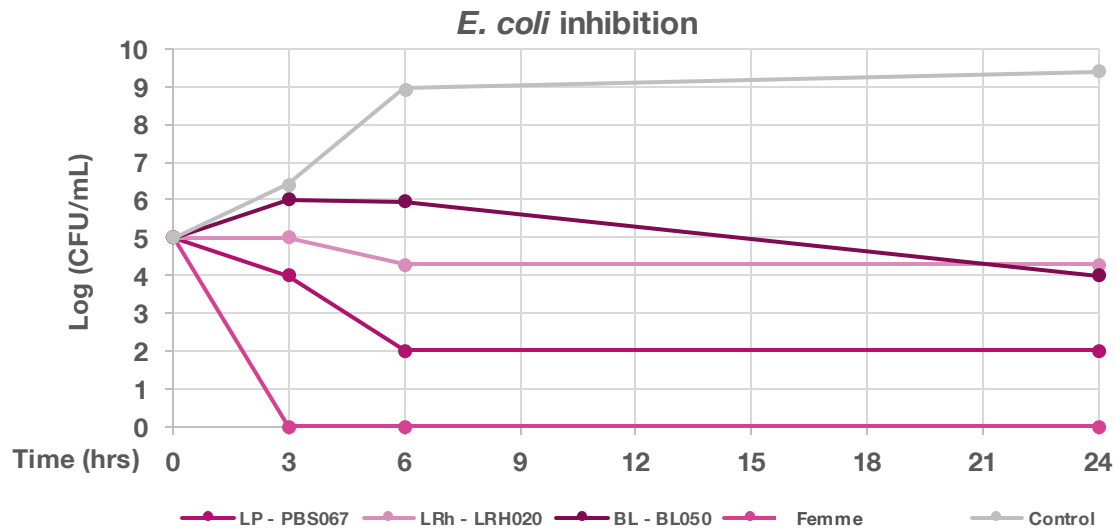
- 1. Migration & colonization:** from intestine to proximal sites, able to proliferate in vaginal epithelium  
→ healthier microbiota & vaginal pH balance
- 2. Anti-microbial activity:** Femme transforms nutrients into helpful metabolites and counteracts pathogens invasion through:
  - *Exclusion:* physical occupation of adhesion sites
  - *Displacement:* pathogen removal from adhesion sites, avoiding biofilm formation
  - *Competition:* quicker settlement than pathogens in adhesion sites
- 3. Anti-inflammatory activity:** double efficacy in quenching the inflammatory status & in preventing pathogens infection by improving the immune system



# Metabolites

➤ **Strong inhibition rate** exerted by probiotic metabolites against a complete spectrum of antagonists involved in uro-genital pathogenesis.

➤ *In-vitro* mimic system of “Treatment model”, intended as previous pathogen growth followed by exposure to Femme probiotic surnatants.



	Treatment model			
	<i>C. albicans</i>	<i>E. coli</i>	<i>E. faecalis</i>	<i>S. aureus</i>
LP - PBS067	//	**	*	**
LRh - LRH020	//	*	**	**
BL - BL050	//	**	//	//
Femme	//	***		

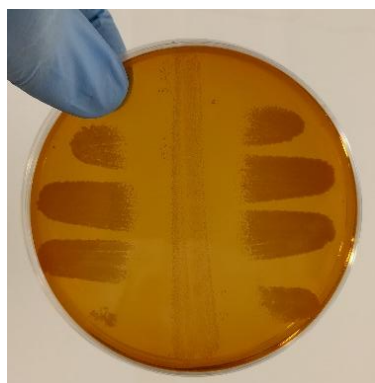
\*\*\* very strong effect    \*\* strong effect    \* significant effect    // no effect

I. Presti, G. D'Orazio, M. Labra, et al., “Evaluation of the probiotic properties of new Lactobacillus and Bifidobacterium strains and their in vitro effect,” Applied Microbiology and Biotechnology, vol. 99, no. 13, pp. 5613-5626, 2015.

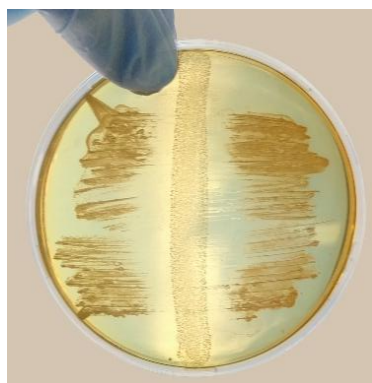


# Overlay Assay

- Strong inhibition rate exerted by probiotics directly against a complete spectrum of antagonists involved in uro-genital pathogenesis.



Strong inhibition



Medium inhibition

- *In-vitro* mimic system of “Prevention model”, intended as previous application of Femme probiotics followed by inoculum of pathogens.

	Prevention model			
	<i>C. albicans</i>	<i>E. coli</i>	<i>E. faecalis</i>	<i>S. aureus</i>
LP - PBS067	**	**	**	**
LRh - LRH020	**	**	**	**
BL - BL050	**	**	**	*
Femme	***	***		

\*\*\* very strong effect

\*\* strong effect

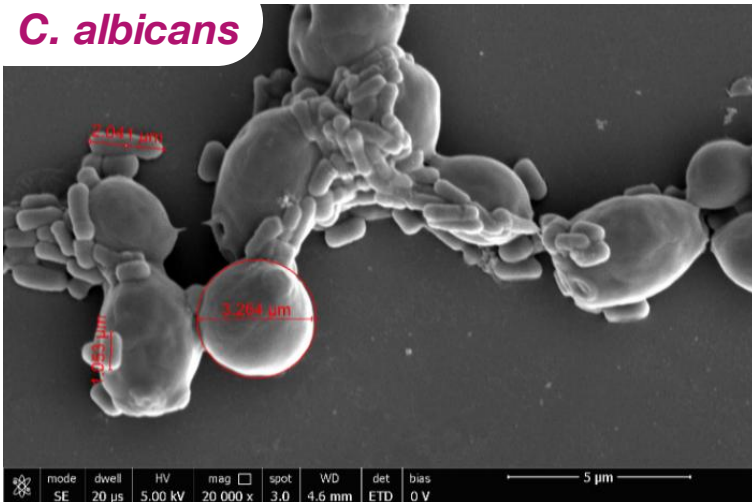
\* significant effect

I. Presti, G. D'Orazio, M. Labra, et al., “Evaluation of the probiotic properties of new Lactobacillus and Bifidobacterium strains and their in vitro effect,” Applied Microbiology and Biotechnology, vol. 99, no. 13, pp. 5613-5626, 2015.

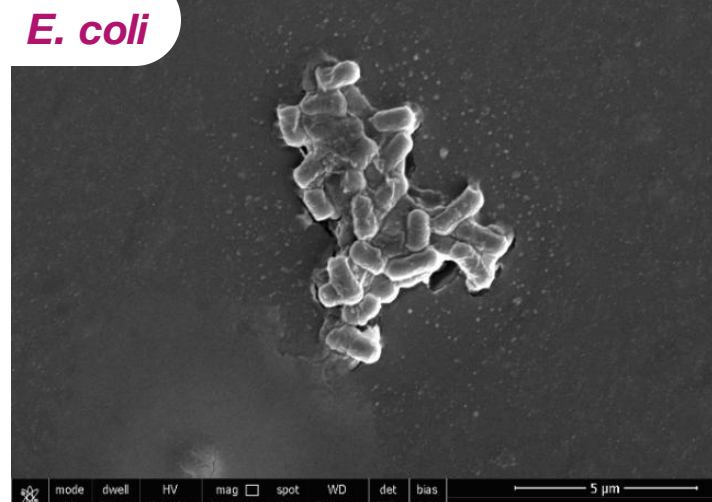
# Co-aggregation with urogenital pathogens

- **Co-aggregation** is a desirable characteristic that lead to an easily pathogens removal from the system.
- Femme strains demonstrate to strongly interact and co-aggregate with pathogens.

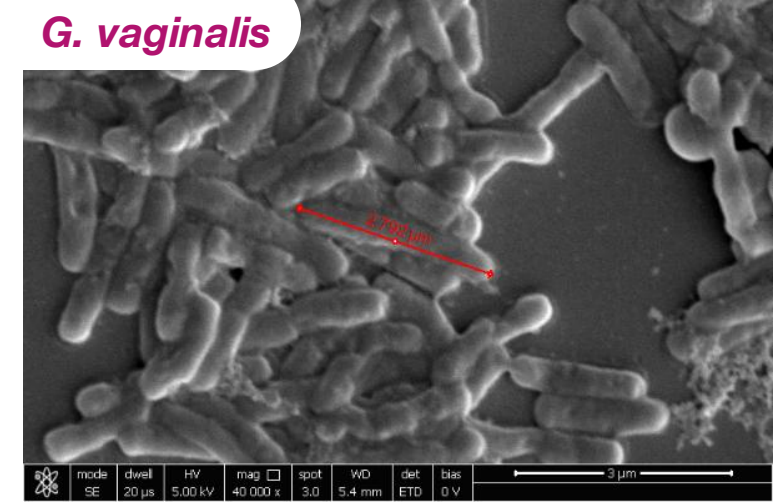
*C. albicans*



*E. coli*



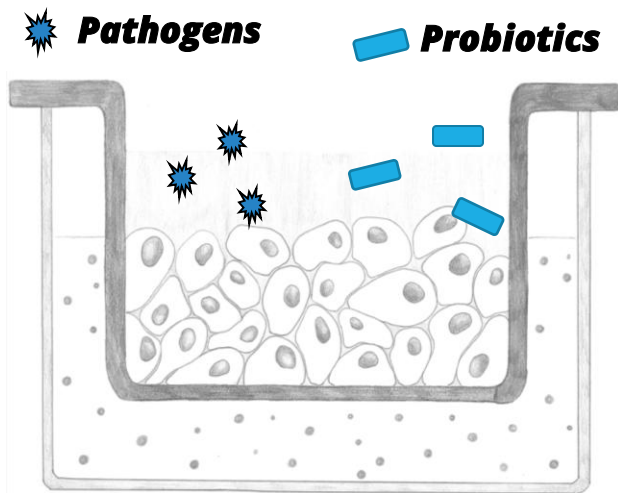
*G. vaginalis*





# Vaginal epithelium

- Strong inhibition rate exerted in both *ex-vivo* mimic systems against specific pathogens involved in vaginal infections.
- Prevention model: previous application of Femme probiotics followed by inoculum of pathogens.
- Treatment model: previous pathogen growth followed by exposure to Femme probiotics.



	Prevention model COMPETITION		Treatment model DISPLACEMENT	
	<i>G. vaginalis</i>	<i>A. vaginae</i>	<i>G. vaginalis</i>	<i>A. vaginae</i>
LP - PBS067	*	*	**	**
LRh - LRH020				

\*\*\* very strong effect

\*\* strong effect

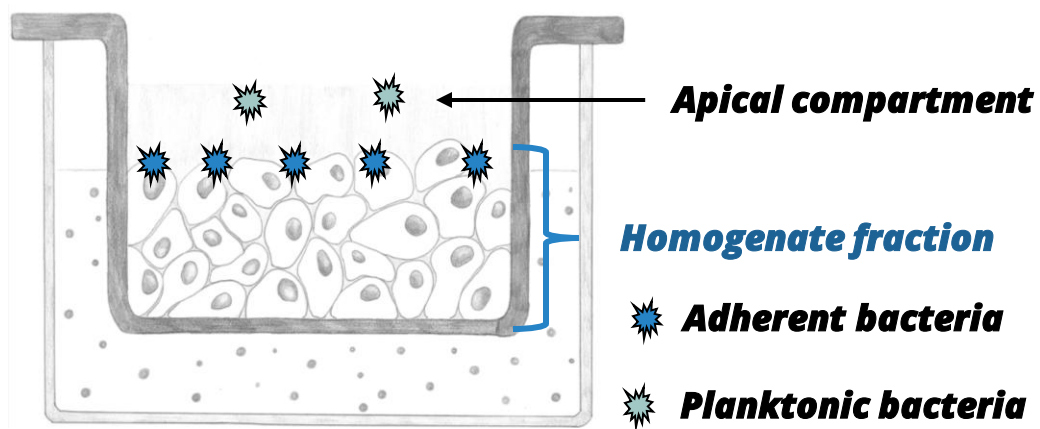
	Femme		
	<i>C. glabrata</i>	<i>T. vaginalis</i>	<i>N. gonorrhoeae</i>
Prevention model	***	**	**
Treatment model	**	***	**

\* significant effect

Malfa, Patrizia, et al. "Evaluation of Antimicrobial, Antiadhesive and Co-Aggregation Activity of a Multi-Strain Probiotic Composition against Different Urogenital Pathogens." International Journal of Molecular Sciences 24.2 (2023): 1323.

# Bladder epithelium

- Strong inhibition rate exerted in both *ex-vivo* mimic systems against *E.coli*.
- Prevention model: previous application of Femme probiotics followed by inoculum of pathogens.
- Treatment model: previous pathogen growth followed by exposure to Femme probiotics.



	Prevention model		Treatment model	
	APICAL	HOMOGENATE	APICAL	HOMOGENATE
LP - PBS067	*	**	//	*
LRh - LRH020	*	***	*	***
BL - BL050	***	*	//	*

\*\*\* very strong effect

\*\* strong effect

\* significant effect

// no effect

Malfa, Patrizia, et al. "Evaluation of Antimicrobial, Antiadhesive and Co-Aggregation Activity of a Multi-Strain Probiotic Composition against Different Urogenital Pathogens." International Journal of Molecular Sciences 24.2 (2023): 1323.

# Protection effect

Femme demonstrates:

- Effectiveness in slowing down the inflammatory status activated by TNF- $\alpha$
- Help activating the immunity response by improving IL-4 cytokine release
- A synergic antioxidant potential compared to single strains
- Protection of cell viability after induced stress

	Balb 3T3 (systemic cell line)			
	TNF- $\alpha$	IL-4	FRAP	Cell protection
LP - PBS067	↓	↑	↑	↑
LRh - LRH020	↓	↑	↑	↑
BL - BL050	//	↑	↑	//
Femme	↓↓	↑↑	↑↑	↑

I. Presti, G. D'Orazio, M. Labra, et al., "Evaluation of the probiotic properties of new Lactobacillus and Bifidobacterium strains and their in vitro effect," Applied Microbiology and Biotechnology, vol. 99, no. 13, pp. 5613-5626, 2015.

**Protocol:** protection from inflammatory stress induced by sodium dodecyl sulphate, antioxidant power (AOP) & reducing properties. Inhibition of pro-inflammatory TNF-alpha. Improvement of anti-inflammatory IL-4. Murine model: Fibroblasts line (BALB/c3T3, clone A31). Outcomes at 24h (acute, darker) and 5dd (chronic, lighter). CTR+: SDS/ CTR -: no treatment

# Clinical study design - Vaginal colonization



## PROTOCOL:

- **Performed analysis:** vaginal tampons & questionnaire
- **Analytical technique:** Real time – PCR. Checkpoint performed at T0, T7, T14, T21 (7dd wash out)

## EVALUATED PARAMETERS:

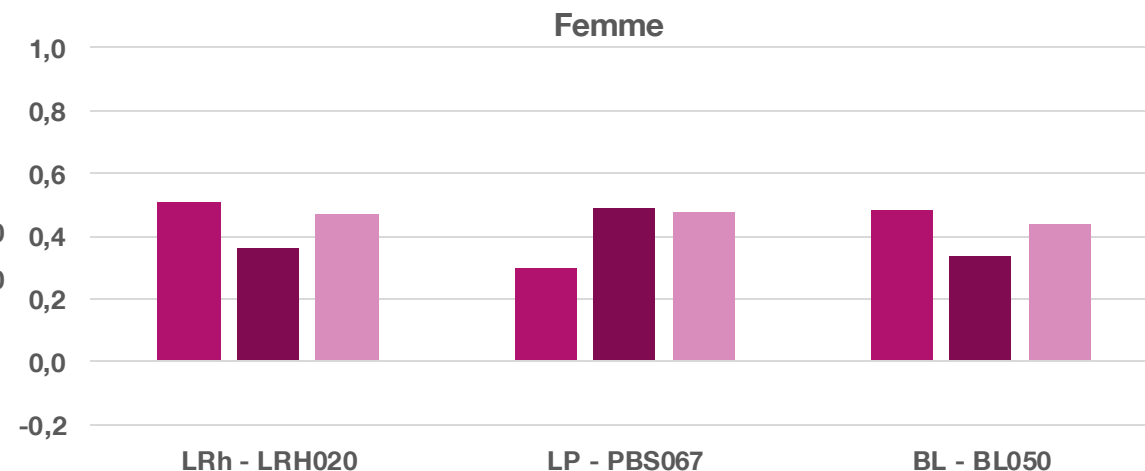
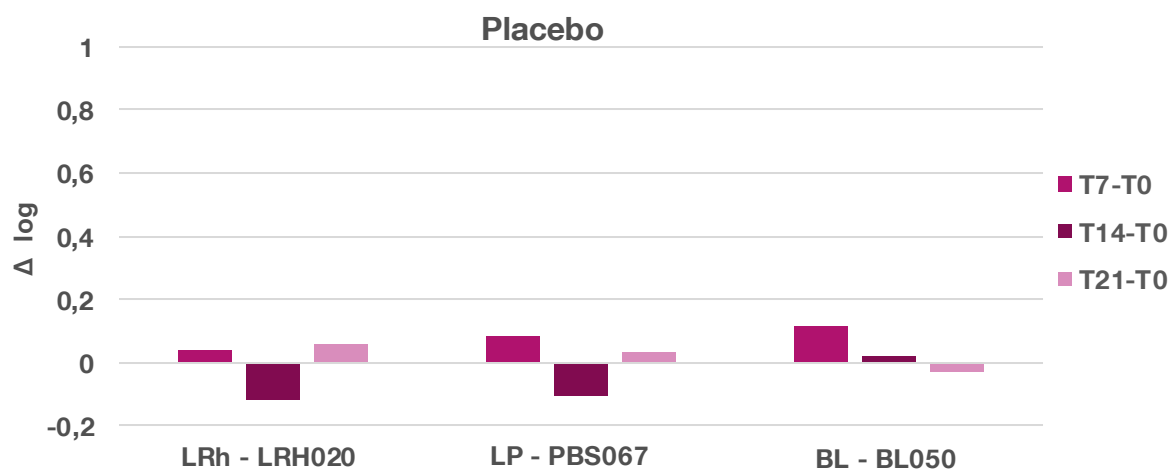
- Colonization of vaginal microbiota
- pH

Mezzasalma, Valerio, et al. "Orally administered multispecies probiotic formulations to prevent uro-genital infections: a randomized placebo-controlled pilot study." Archives of gynecology and obstetrics 295.1 (2017): 163-172.



# Vaginal colonization

- Femme demonstrated to reach and **colonize vagina from oral intake**, showing a **significant increase** of the administered strain in the **active group** respect to placebo.

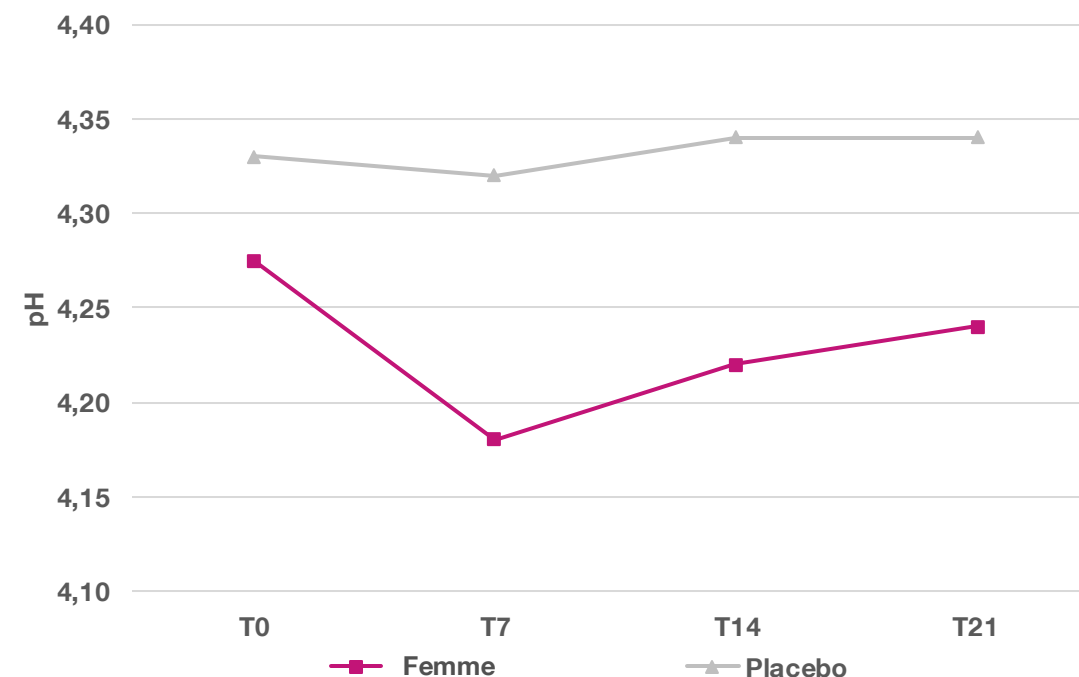


Mezzasalma, Valerio, et al. "Orally administered multispecies probiotic formulations to prevent uro-genital infections: a randomized placebo-controlled pilot study." Archives of gynecology and obstetrics 295.1 (2017): 163-172.

**Protocol:** randomized, double blind, placebo controlled, oral intake for 14 days done on 20/group healthy women. Method: vaginal tampons & questionnaire. Outcome: colonization of vaginal microbiota, pH and self-assessment. Analytical technique: Real time – PCR. Analysis performed at T0, T7, T14, T21 (7dd wash out).

# Vaginal pH variation

- Similar trend in both placebo and active group probably due to the pH trend in monthly period.
- Femme helps to **maintain a strong acidification profile**.



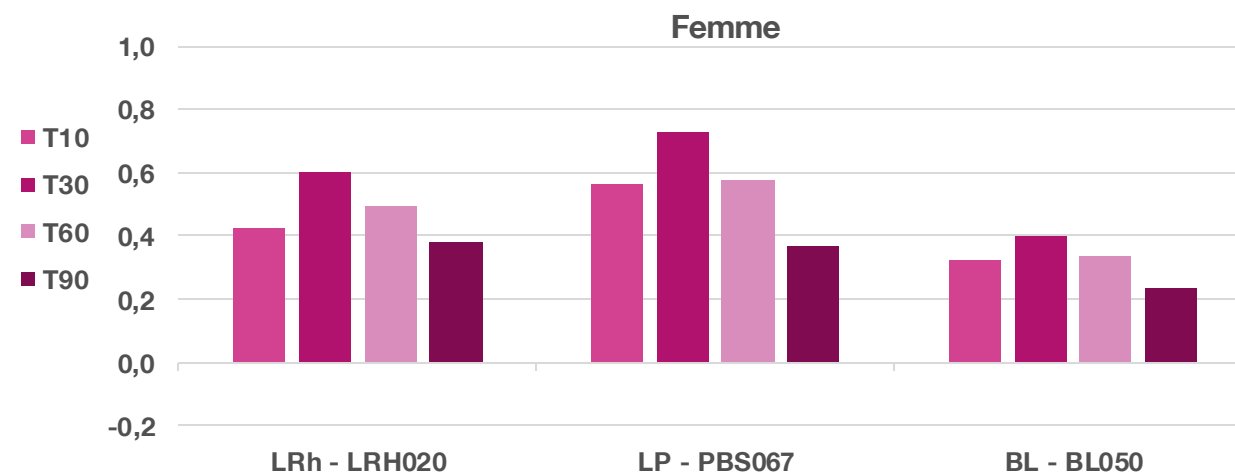
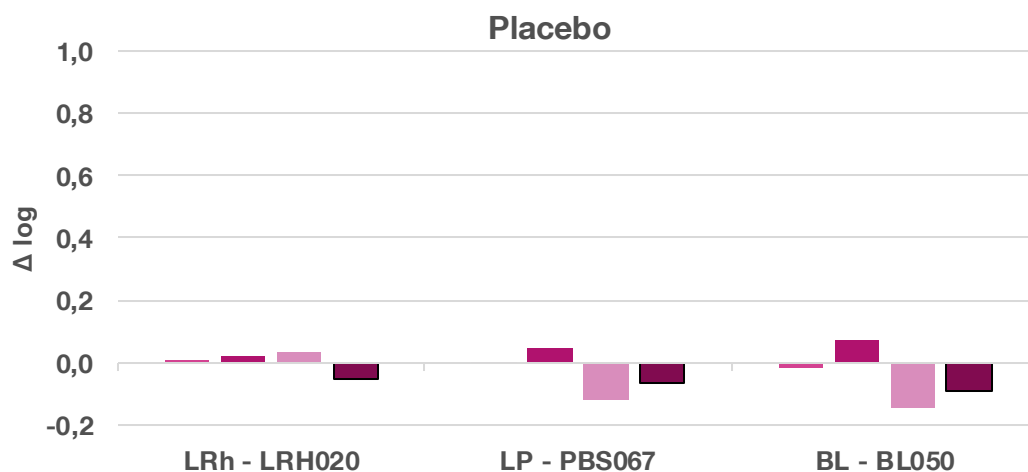
**Protocol:** randomized, double blind, placebo controlled, oral intake for 14 days done on 20/group healthy women. Method: vaginal tampons & questionnaire. Outcome: colonization of vaginal microbiota, pH and self-assessment. Analytical technique: Real time – PCR. Analysis performed at T0, T7, T14, T21 (7dd wash out).





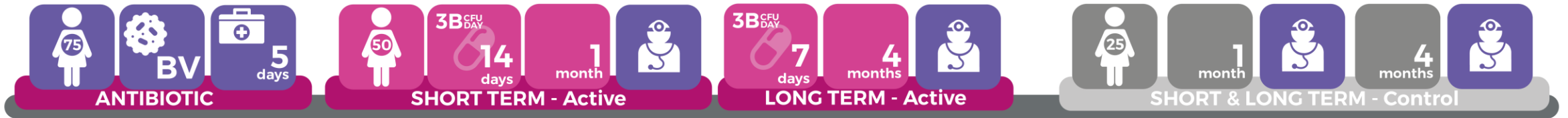
# Clinical evidence of GI colonization

- No significant increase in the placebo group for any specie, selective, consistent and significant improvement of administered strains in the study groups.
- Evident correlation with vaginal colonization from oral intake confirming proximal bacterial migration.



V. Mezzasalma et al., "A Randomized, Double-Blind, Placebo-Controlled Trial: The Efficacy of Multispecies Probiotic Supplementation in Alleviating Symptoms of Irritable Bowel Syndrome Associated with Constipation" BioMed Research International, 2016.

# Clinical study design - BV recurrences



## EVALUATED PARAMETERS:

- Reduction of BV recurrence rate
- Vaginal microbiota restoration
- Improvement of BV associated symptoms

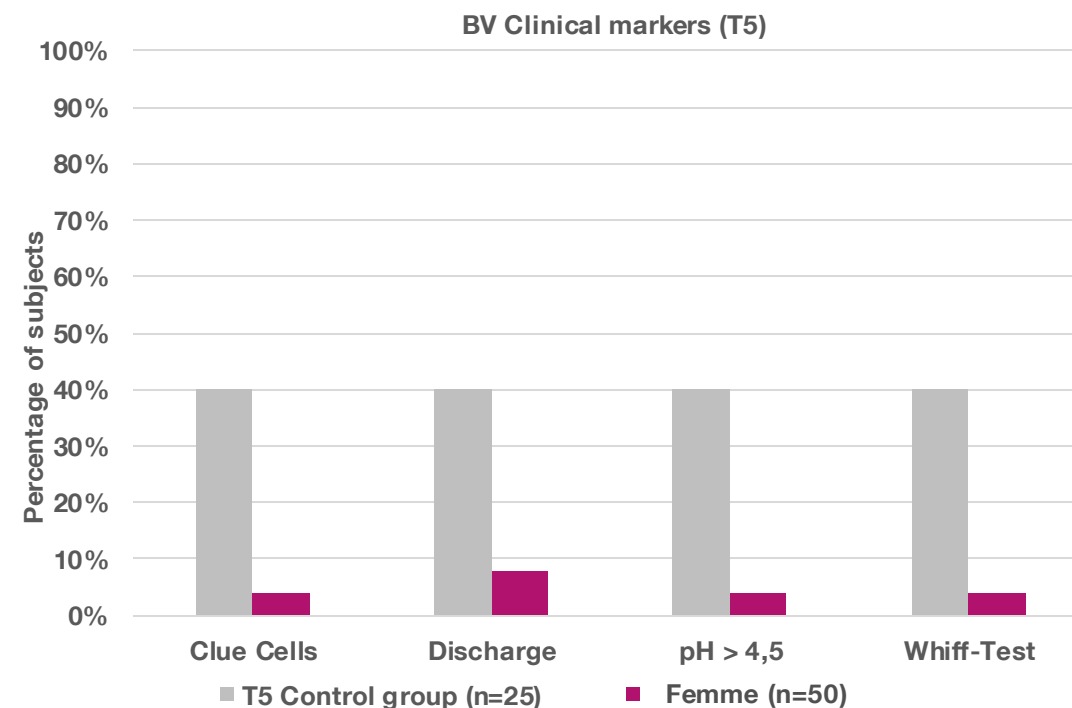
BV diagnosis	ANTIBIOTIC	REINTEGRATION	OBSERVATION & MAINTAINING
<b>Enrollment</b>	Metronidazole local treatment	Femme 1 dose/die x 14 days	Femme 1 dose/die x 7 days
<b>Day 0</b>	Day 1 - 5	Day 6 - 20	After the period, for 4 cycles
<b>Study Start</b>	5 days	Month 1 <sup>st</sup>	Months 2 <sup>nd</sup> – 5 <sup>th</sup>

Murina, Filippo, and Franco Vicariotto. "Evaluation of an Orally Administered Multistrain Probiotic Supplement in Reducing Recurrences Rate of Bacterial Vaginosis: A Clinical and Microbiological Study." *Advances in Infectious Diseases* 9.3 (2019): 151-161.



# BV clinical markers

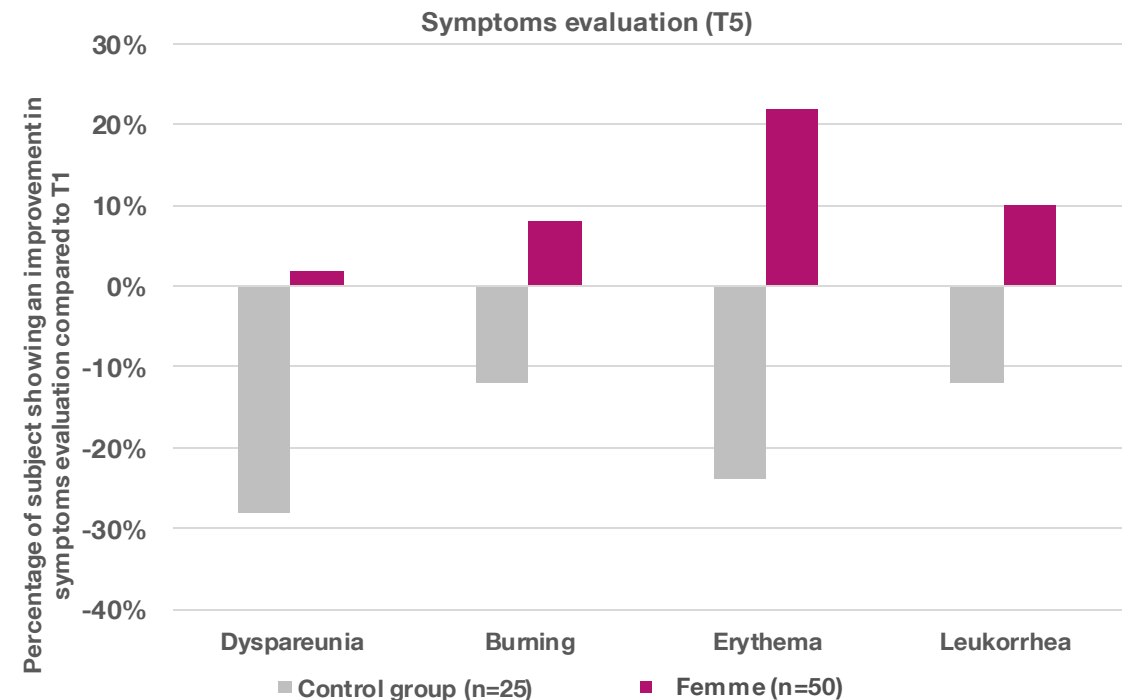
- Femme strains were able to reduce from 40% to 4% all clinical markers of BV after 5 months, compared to control group.
- Particularly, the **amelioration of BV clinical markers** between active and control groups improved from **+16% at T1 to +36% at the end of the study.**



Murina, Filippo, and Franco Vicariotto. "Evaluation of an Orally Administered Multistrain Probiotic Supplement in Reducing Recurrences Rate of Bacterial Vaginosis: A Clinical and Microbiological Study." *Advances in Infectious Diseases* 9.3 (2019): 151-161.

# Symptoms & signs evaluation

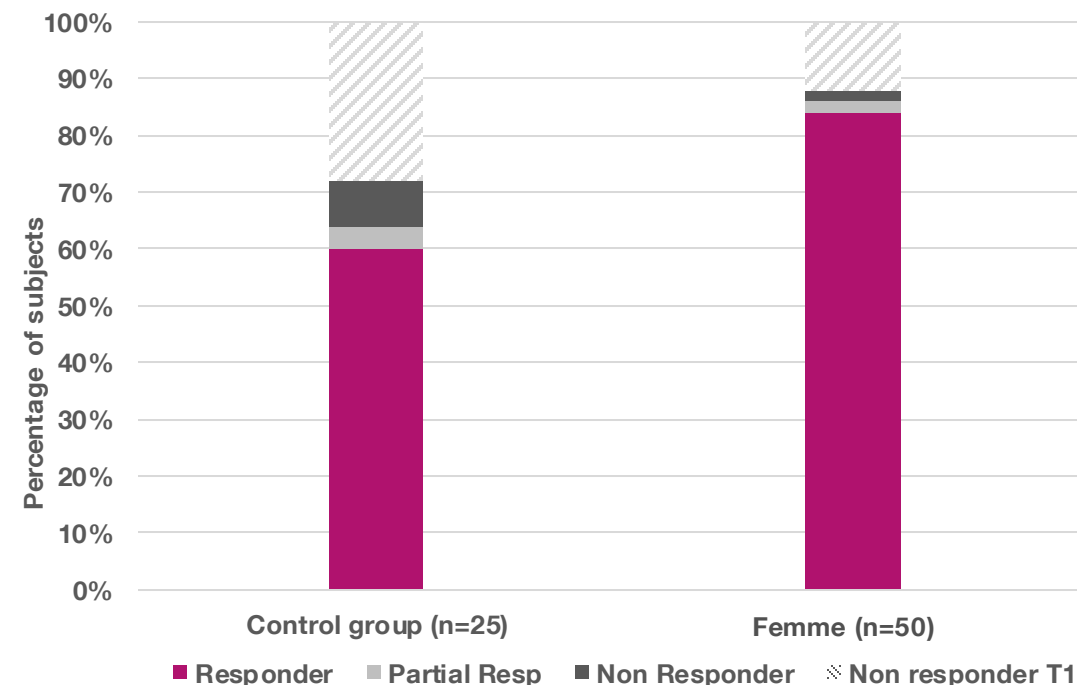
- Both negative control (AB) and active groups (AB+pb) provided a good symptoms relief after the acute treatment.
- The added value of Femme is evident on the medium-long term period (T1-T5), because it was able to reduce the worsening of symptoms recorded in the group administered with only AB.



Murina, Filippo, and Franco Vicariotto. "Evaluation of an Orally Administered Multistrain Probiotic Supplement in Reducing Recurrences Rate of Bacterial Vaginosis: A Clinical and Microbiological Study." *Advances in Infectious Diseases* 9.3 (2019): 151-161.

# BV Recurrence rate

- Success rate of AB therapy, further improve by **+24% with Femme intake**.
- Recurrences rate dramatically dropped from 40% in the negative control group (in line with epidemiological data) to 16% in the pb group.
- **No adverse effect** was reported and compliance was very good according to a self-assessment evaluation (no drop-out cases recorded).

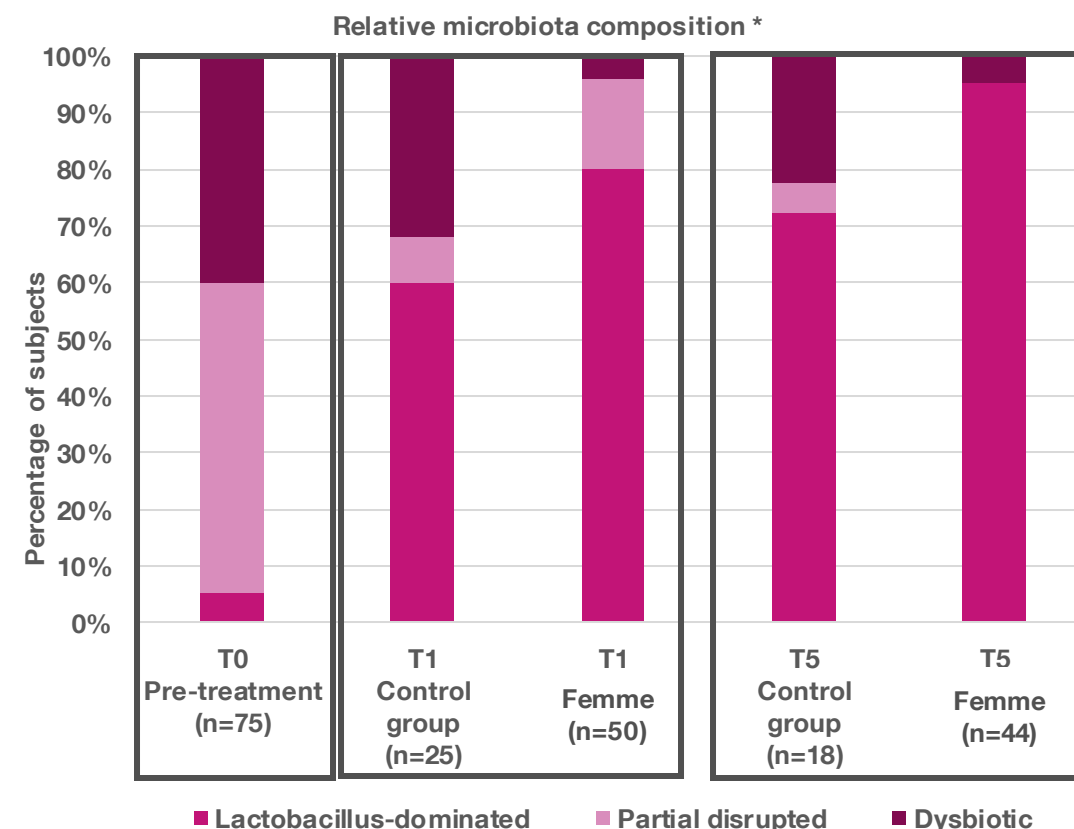


Murina, Filippo, and Franco Vicariotto. "Evaluation of an Orally Administered Multistrain Probiotic Supplement in Reducing Recurrences Rate of Bacterial Vaginosis: A Clinical and Microbiological Study." *Advances in Infectious Diseases* 9.3 (2019): 151-161.

# Vaginal microbiota restoration

- Evident supremacy of Femme with respect to control in recovering the *Lactobacillus*-dominated microbiota after reintegration period (14 days).
- Long-term supplementation with Femme recovered *Lactobacillus* spp. by **over 90% with a complete resolution of symptoms**.
- Instead a 30% of subjects in the control group still showed a partial / total dysbiotic status.

\* = non responder at T1



Murina, Filippo, and Franco Vicariotto. "Evaluation of an Orally Administered Multistrain Probiotic Supplement in Reducing Recurrences Rate of Bacterial Vaginosis: A Clinical and Microbiological Study." *Advances in Infectious Diseases* 9.3 (2019): 151-161.





## Clinical study design - Menopause



### CLINICAL OBSERVATION

- › Improvement of vaginal health through Vaginal Health Index
- › Reduction of inflammatory pattern
- › pH reduction

### INSTRUMENTAL EVALUATION

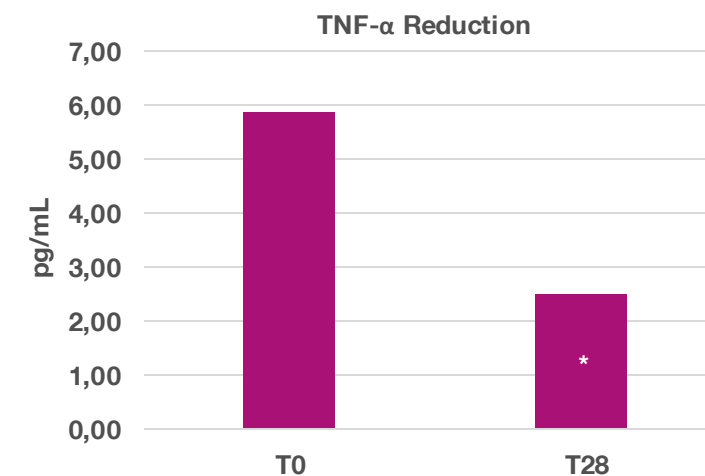
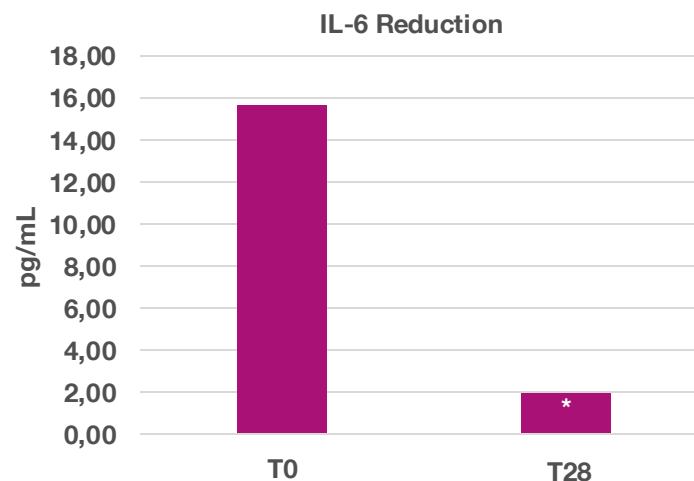
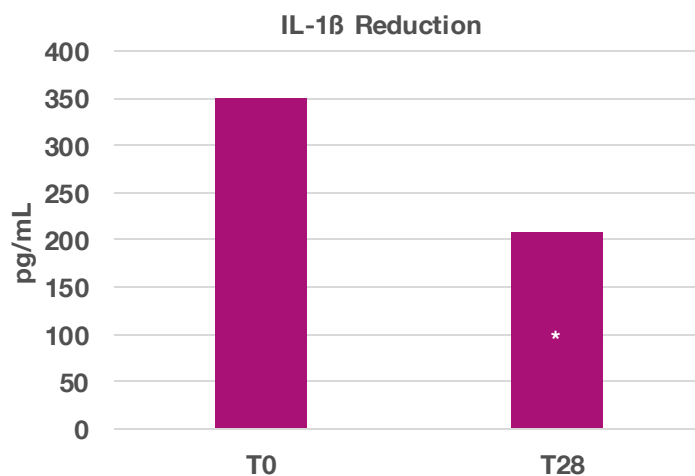
- › Evaluation of vaginal ecosystem fluctuation
- › Pro-inflammatory cytokines reduction IL-6, IL-1 $\beta$ , TNF- $\alpha$  through vaginal swabs.

Vicariotto F, Malfa P, et al. "Efficacy of Lactiplantibacillus plantarum PBS067, Bifidobacterium animalis subsp. lactis BL050, and Lactisacibacillus rhamnosus LRH020 in the Amelioration of Vaginal Microbiota in Post-Menopausal Women: A Prospective Observational Clinical Trial". Nutrients. 2024; 16(3):402.



# Inflammatory pattern profile

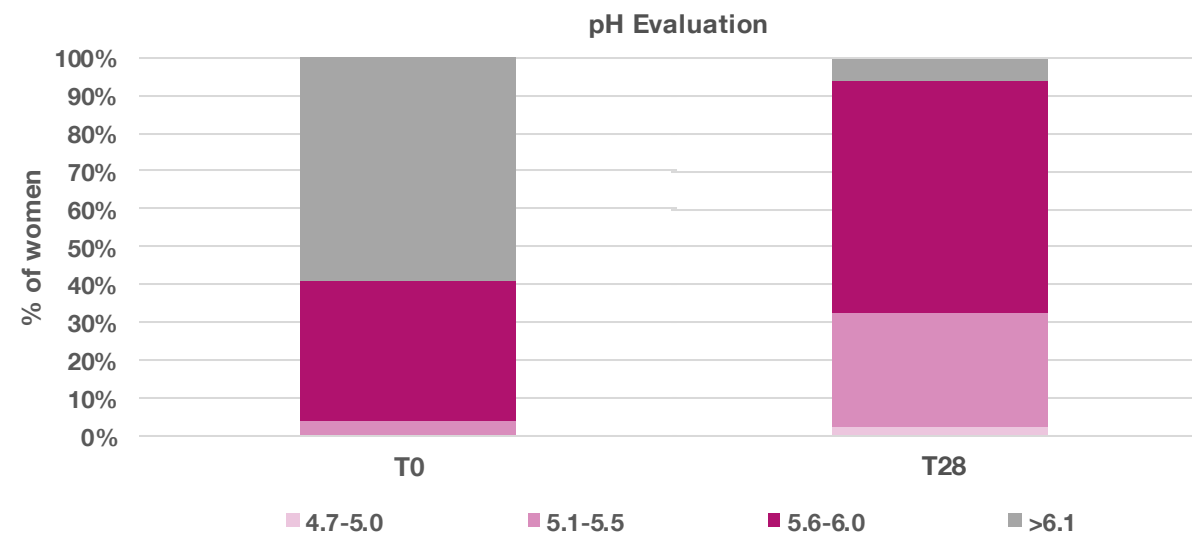
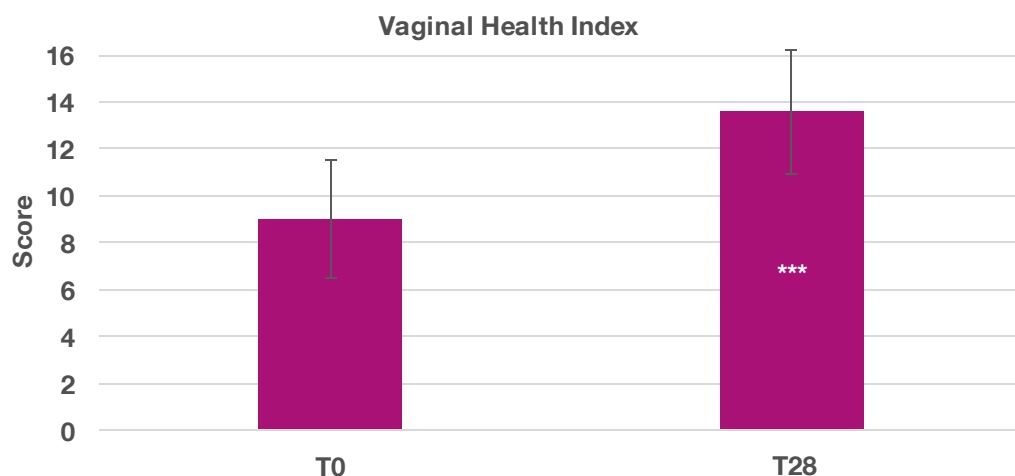
- The enhance of vaginal aerobic infections causes an immunological response **leading to a pro-inflammatory profile**.
- Femme demonstrated to **significantly reduce the inflammatory pattern** (IL-6, IL-1 $\beta$ , TNF- $\alpha$ ) induced by menopausal physiological changings (\*p<0.05).





# Vaginal health evaluation

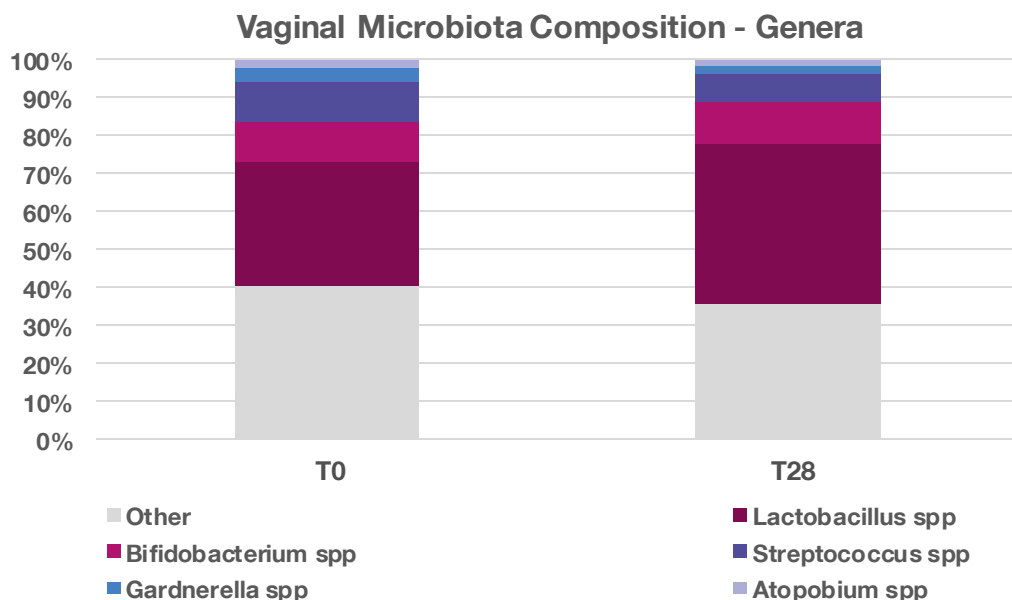
- **Vaginal Health Index** is a scoring system performed by gynaecologist evaluating the vaginal elasticity, secretion, pH, mucosa integrity and lubrication. The reduction of vaginal pH, due to the restoration of *lactobacilli*, favours the **inhibition of pathogens growth**.
- Femme demonstrated to improve up to 50% the vaginal health situation of menopausal women as well as pH amelioration throughout the study.



# Vaginal microbiota fluctuations

The vaginal microbiota analysis highlights that Femme at genera level:

- Increase the presence of *Lactobacillus* and *Bifidobacterium* genera.
- Decrease the abundance of recurrent vaginal pathogens such as *Streptococcus*, *Gardnerella*, *Atopobium*, and *Escherichia-Sighella* genera.

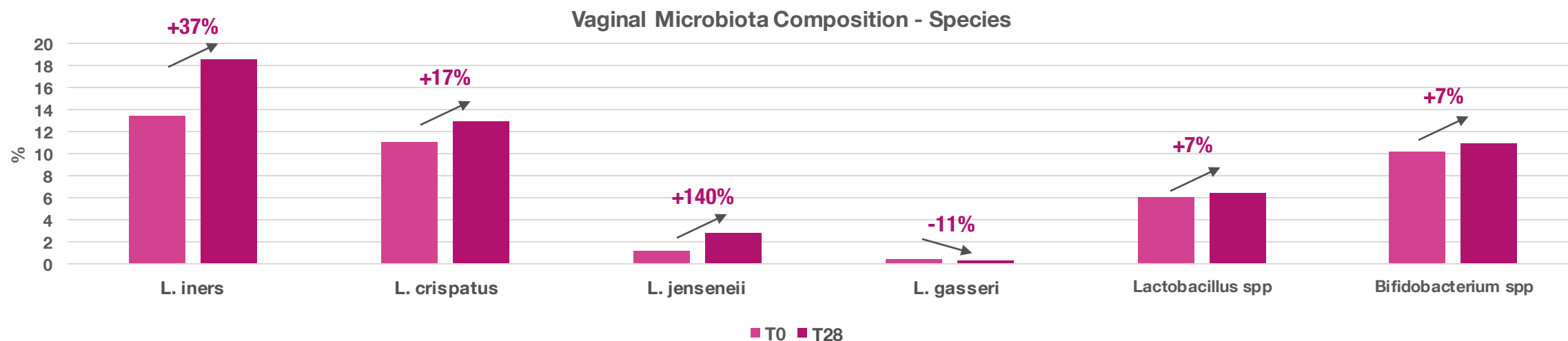


Genera:	T0 vs T28
↑ <i>Lactobacillus</i>	+28%
↑ <i>Bifidobacterium</i>	+7%
↓ <i>Streptococcus</i>	-30%
↓ <i>Gardnerella</i>	-41%
↓ <i>Atopobium</i>	-23%
↓ <i>Staphylococcus</i>	-35%
↓ <i>Escherichia-Sighella</i>	-8%

# Vaginal microbiota fluctuations

The vaginal microbiota analysis highlights that Femme:

- Increase the abundance of CST leading species as *L. crispatus*, *L. iners* and *L. jenseneii*, providing a shift in patients from CST IV (pathologic) to healthier CST.
- Slight reduction of *L. gasseri* which is mostly associated to fertile age women.
- Rise the abundance of other *Lactobacillus* and *Bifidobacterium* species.





# Clinical study in progress - Candidiasis

**KEEP AN EYE OUT FOR  
THE LATEST UPDATE!**







## Summary

**Description:** Probiotic complex designed for women's health composed by *L. plantarum* - PBS067, *L. rhamnosus* - LRH020, *B. lactis* - BL050

**Dosage:** 3B CFU/Day (1B CFU/strain)

**Treatment:** minimum 14 days



Capsules



Tablets



Sachets  
or sticks



Triphase  
vials



Bulk / Full  
service

### RESULTS:

- ✓ Pathogens inhibition
- ✓ Modulation of inflammation
- ✓ Vaginal colonization
- ✓ Vaginal microbiota restoration
- ✓ Recovery from vaginal dysbiosis
- ✓ Symptoms improvement

### TYPICAL APPLICATIONS:

- ✓ Bacterial vaginosis
- ✓ Candidiasis
- ✓ Menopause management
- ✓ Pre-term delivery
- ✓ Constipation in pregnancy
- ✓ Post-antibiotic dysbiosis
- ✓ Infertility prevention



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