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Food supplement for daily formation of red blood cells, reducing fatigue

Food supplement for daily formation of red blood cells reducing fatigue, increasing haemoglobin and strengthening immunity with vitamins B12, D3 and K2MK7.

L plantarum's effect on iron absorption and RBC:

- Increases Iron Absorption and Hemoglobin levels.
- Reduces Fatigue and Tiredness associated with anemia and promotes a good health.
- Strengthen the immune system.

-	-	•		•	-
Parameters	Study group (n=10)		Control gro	Total serum iron concentration	
	Mean	SD	Mean	SD	
S-Fe (umol/l)	19.4	4.1	17.5	3.6	
Ferritin (ng/ml)	44.0	9.2	41.9	7.2	
					11%
TIBC (ug/l)	69.6	6.8	64.7	5.6	
Hb (g/l)	138.9	8.5	135.3	5.3	

20-40 years healthy women prone to iron deficiency Total Participant 20

25

L plantarum shows the positive effects on iron absorption by creating an acidic environment in the intestinal tract which makes iron more absorbable, making iron biologically available by producing iron-chelating ligands, or degrading mineral complexing phytic acid from food.

Davor J. Korčok, et al Chem Pharm Bull (Tokyo). 2018 Apr

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Serum iron concentration (μ mol/I)

Study group Control group

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Non-heme iron absorption from the meals containing the four different oat gruels

	. ,	rmented gruel*		(B) Pasteurised fermented oat gruel		(C) Non-fermented oat gruel (pH-adjusted)		(D) Non-fermented oat gruel with organic acids	
Meal	Mean	95 % CI	Mean	95 % CI	Mean	95 % CI	Mean	95 % CI	
Non-haem Fe absorbed in blood (%)†	1.1ª	0.8, 1.5	0-6 ^b	0.4, 0.7	0-5 ^b	0.4, 0.7	0-5 ^b	0.4, 0.7	

- L. Plantarum fermented oat gruel shows significant (P<0.0001) improvement in Non-haem Fe absorption in the blood compared to the different oat gruels.
- In Fermented Oats Gruels the improvement in iron absorption is solely by L. plantarum, which shows L. plantarum significantly improve in iron absorption.



Absorption of non-heme iron from a fruit drink containing *L. plantarum* is **50%** higher compared with a similar fruit drink without *L. plantarum* **19 %.**

Hoppe M, et al. Br J Nutr. 2015, Bering S, et al. British Journal of Nutrition. 2006



Effects of probiotics on iron absorption and iron status-related markers in humans

Findings of Meta-Analysis



Lactobacillus plantarum 299v increased dietary non-heme iron absorption in healthy white Europeans who were primarily women.

Vonderheid SC et al Nutrients 2019, 11, 2938

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Rationale for the **ProFem** Composition

L. plantarum INDUCIA® and L. plantarum TENSIA®

Composition Reason:

- *L. plantarum* INDUCIA[®] and *L. plantarum* TENSIA[®] have antioxidant effects and help to balance gut microbiota (lactic acid bacteria and a balanced gut microbiota helps to increase the bioavailability of dietary iron.
- *L. plantarum* INDUCIA[®] has strong anti-oxidative properties.





Food supplement with Lactobacillus plantarum TENSIA®, B vitamins and minerals

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Food supplement with Lactobacillus plantarum TENSIA®, B vitamins and minerals

Cardio-protective effect of L. plantarum Tensia®

- Tensia produces blood pressure-lowering compounds (NO and ACE inhibitors)
- Works synergistically with vitamins and minerals
- Protect from excessive oxidative stress
- Contributes to the normal function of the heart
- Folate, Vitamin B6, Vitamin B12 contribute to normal homocysteine metabolism
- Probiotic *L. plantarum* TENSIA lowered diastolic and systolic blood pressure regardless of food matrix

Lactobacillus plantarum TENSIA® + B vitamins + Minerals

Antihypertensive effect of Lactobacillus plantarum TENSIA®



Control group (n= 59)

b Change 4 weeks p = 0.914 p = 0.026 p = 0.026p = 0.026 Patient population: High normal (130-139/85-89 mmHg) or hypertension Grade 1 HT (140-159/90-99 mmHg)

8-week treatment with Tensia causes significant reduction in SBP and DBP

Ref: Hütt P et al, IDF Bulletin, 2014

Food supplement with Lactobacillus plantarum TENSIA®, B vitamins and minerals

TENSIA induces NO generation in host cells independently of its own NO production capability

TENSIA induces ACE inhibitory activity that helps in maintaining blood pressure

Growth environment	MRS broth	Skim milk
Medium + 3 mg NaNO ₃	4.5±0.9	3.4±0.7
Medium + 30 mg NaNO ₃	11.0±2.2	3.6±0.7
Control (medium with TENSIA)	2.6±0.8	1.2±0.2
Negative control (medium without TENSIA)	0.0±0.0	0.0±0.0



Tensia : IC50 of 2.7 $\mu M,$ Control milk IC50: 6.6 $\mu M.$

Ref: Hütt P et al, Beneficial Microbes, 2015; 6(3): 233-243



Food supplement with *Lactobacillus plantarum* TENSIA®, B vitamins and minerals



Week	Crowne	Average Red	uction in BP
vveek	Groups	SBP	DBP
M/ook 9	L.plantarum TENSIA®	6.66 mmHg	4.34 mmHg
Week 8	Placebo	2.56 mm Hg	1.21 mmHg

Lactobacillus plantarum TENSIA® is an effective dose for achieving the maintenance of normal blood pressure

Ref: Hütt P et al, IDF Bulletin, 2014

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Food supplement with *Lactobacillus plantarum* TENSIA[®], B vitamins and minerals

			Probiotic period			Placebo period			
Variable	Baseline	Post 3 weeks		p value	ı	Baseline	Post 3 weeks	p value	
SBP (mm Hg)	131.0±8.1	127.9±10.9		0.0006		128.7±12.4	126.2±11.2	0.057	
DBP (mm Hg)	83.4±8.5	81.0±8.3		0.0004		82.8±8.9	81.4±8.1	0.046	
SBP [BMI<25]	130.5±7.0	126.1±10.4		0.001		126.7±13.2	124.7±10.3	0.213	
SBP [BMI≥25]	131.5±9.2	129.7±11.1		0.064		130.8±11.3	127.8±12.0	0.048	
DBP [BMI<25]	82.1±8.0	79.5±8.2		0.009		80.7±8.8	79.7±7.7	0.311	
DBP [BMI≥25]	84.6±8.9	82.7±8.3		0.017		84.8±8.5	83.1±8.3	0.055	

- Diastolic blood pressure (DBP) and Systolic blood pressure (SBP) significantly decreased during the probiotic period
- The reduction in blood pressure was more prominent with a lower BMI (<25 kg/m²) than with a higher BMI (≥25 kg/m²)

L. plantarum TENSIA lowered diastolic and systolic blood pressure regardless of food matrix and baseline values of blood pressure and BMI. Thus, decreasing the CVD risk

Ref: P. Hütt et al. Beneficial Microbes, 2015





ProShield 2 in 1

Synergistic food supplement with Lactobacillus plantarum INDUCIA®, vitamins, minerals and curcumin

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ProShield

Daily Advantage

nutra 2 in 1

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ProShield 2 in 1

Synergistic food supplement with Lactobacillus plantarum INDUCIA®, vitamins, minerals and curcumin.

- Contributes to resilience against intestinal infections.
- Contribute to the normal functioning of the immune system
- Help reduce tiredness and exhaustion
- Reduces the risk of a food-related infection
- Protect from oxidative stress

Modulation of innate immune response

Lactobacillus plantarum INDUCIA®
(5.0 x 109 cfu -live microorganisms)
+ Curcuma longa + Vit C+Zn+ Vit
A+Se+ Vit D3

Markers	Baseline	Post 3 weeks	P values	Normal Range and Units
Monocytes	0.55 ± 0.17	0.64 ± 0.15	0.032	0.15–0.75 × 10^9/L
Cytokine IL-6	2.7 ± 1.0	3.8 ± 1.7	0.020	< 3.4 ng/L
IgA antibodies	2.5 ± 0.9	2.3 ± 0.8	0.009	0.7–4.0 g/L
IgM antibodies	1.3 ± 0.5	1.3 ± 0.6	0.776	0.4–2.3 g/L
IgG antibodies	12.9 ± 3.2	12.4 ± 3.9	0.017	7.0–16 g/L
IgE antibodies	19.6 ± 21.2	21.4 ± 25.9	0.232	< 85 kU/L

Patient population: Healthy subjects (n=12)

- *L. plantarum* Inducia and its food products can enhance the innate immune markers
- Significant increase in the monocyte and cytokine IL-6 values
- Decrease in the IgA and IgG antibodies was maintained in the normal range of units.

Ref: Mikelsaar M. et al, J. Funct. Foods,2020





5 beneficial probiotic strains support for during and after antibiotic treatment, travel and periods of stress

5 beneficial probiotic strains support for during and after antibiotic treatment, travel and periods of stress

- Support during and after antibiotic treatment, travel and periods of stress
- L. Plantum Inducia helps and protect in restoring the normal intestinal microbiota.
- Possess an antimicrobial activity against intestinal infection and increases the resilience of an organism against such infections.
- Prevents from excessive oxidative stress.

Pre Fed hamsters with *L Plantum* Inducia with Xylitol before ampicillin and C Diff Spores in G3 syn group have significant rate of survival compared to other groups.





Group	Exp Infection Model	Mortality Rate
Control	G1-CD	87%
Post Induction	G2-Ind	100%
matchin	G2-Syn	80%
Pre fed	G3-Ind	100%
Group	G3-Xyl	44%
	G3-Syn	22%

Ref: M. Ratsep et al, Anaerobe, 2017 and E. Songisepp et al. J. Funct. Foods, 2022

5 beneficial probiotic strains support for during and after antibiotic treatment, travel and periods of stress

L. plantarum Inducia survives transiently in the human gut.



Daily consumption of the *L. Plantarum* Inducia have significant changes in the OSI (Oxidative stress index) and TPX (Total peroxide) over the period from baseline to 4 weeks to 8 weeks, respectively.

Ref: M. Ratsep et al, Anaerobe, 2017 and E. Songisepp et al. J. Funct. Foods, 2022



5 beneficial probiotic strains support for during and after antibiotic treatment, travel and periods of stress

L. plantarum INDUCIA®

- Reduces LDL-cholesterol in blood
- Protects human body from oxidative damage
- Enhances anti-oxidative activity by reducing oxidative stress markers ox-LDL, OSI and TPX.



Parameter	Change Between Weeks 4 and 8	Change at Week 8 from Baseline	Percentage Reduction
LDL-c	Decrease (p = 0.04)	Significant reduction (p = 0.029)	2.25%
Ox-LDL	Borderline significant reduction at Week 4, Significant reduction at Week 8 (p = 0.055)	Significant reduction compared to baseline (p =0.003)	2.41% at Week 4, 7.43% at Week 8

E. Songisepp et al, J. Funct. Foods,2022

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Take Action On Your Joint And Bone Health



Contributes to the maintenance of normal bones and muscle function

L plantarum anti-inflammatory and analgesic effect

- Repairs cartilage and protect joint tissues.
- Increases Joint mobility, flexibility and support joint structure.
- Elevates body's antioxidant activity



ACLT-induced cartilage damage was minimal in ACLT +*L Plantarum* group and the Cartilage score was also significantly superior to the ACLT group.

Ref: Yen-You Lin, et al Nutrients 2022



Weight bearing behavior after 6 weeks

Study Group	Control (n=6)	ACLT +L Plantarum (n=8)	ACLT (n=6)
Force Exerted by each limb	7.7 ± 2.8 g	22.4 ± 5.0 g	58.1 ± 6.7 g

ACLT + *L. plantarum* group showed improved asymmetry in weight-bearing behavior i.e. approximately half that of the ACLT-only group and close to that of the control group by week 6.

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Contributes to the maintenance of normal bones and muscle function



Downregulation of IL-1 β and TNF- α levels :

- Prevent mechanical pain hypersensitivity by decreasing the expression of nerve growth factor.
- Also decreases the phosphorylation state of transient receptor potential vanilloid receptor 1 (TRPV1), critical mediators of inflammatory pain signaling.

L. plantarum showed marked downregulation of IL-1 β and TNF- α levels and significantly less ICH scores compared to ACLT group thus improving the joint pain and the weight-bearing asymmetry

Ref: Yen-You Lin, et al Nutrients 2022



Contributes to the maintenance of normal bones and muscle function

Anti-inflammatory and Antioxidative Activity on Urinogenital Tract of L. plantarum MCC1

- L. plantarum MCC1 elevates GSH concentration and reduces the glutathione redox ratio (GSSG/GSH) ratio which results in the suppression of the OxS and the decreased release of 8-EPI (Prostaglandin).
- L. plantarum MCC1 also decrease infiltration of leucocytes and thus reduce the production of reactive oxygen species (ROS).

	Study Gro	oup (n=22)	Control Gro	up (n=21)	P value
Characteristics	Baseline (Mean ± SD)	4 weeks (Mean ± SD)	Baseline (Mean ± SD)	4 weeks (Mean ± SD)	p < 0.005
Urinary OxS markers					
• 8-EPI (prostaglandin) in urine	68.5 ± 22.1	58.0 ± 17.9	74.7 ± 18.2	75.1 ± 17.5	p < 0.001
Basic Prostate parameters					
• PSA (ng/mL)	3.9 ± 3.9	2.6 ± 2.6	2.3 ± 2.7	1.7 ± 1.9	p = 0.048
• Q max (mL/s)	11.7 ± 2.9	14.2 ± 5.4	12.1 ± 7.2	13.5 ± 6.0	

L. plantarum MCC1 decreases 8-EPI in urine concomitant with pain reduction and shows improvement in urine flow rate (Q max) and PSA levels significantly in patients with men with moderate lower urinary tract symptoms.

Ref: Ausmees K et al, PLOS ONE,2018

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