Specification of Arthritis Probiotics Capsule

1. Brief Introduction

Product Name: Arthritis Probiotics Capsule

Product Specification: 30 capsules/bottle, 500 mg/capsule

Directions: Take two(2) Arthritis Probiotics capsules daily.

Caution: Consult physician if pregnant/nursing, taking medication, or have a medical condition. Keep out of reach of children.

Storage: store in a cool(below 4℃), dry place to maintain potency.

Potency: *Lactobacillus johnsonii* LBJ 456® (6.5 billion CFU/capsule), *Lactobacillus plantarum* N-1 (6.5 billion CFU/capsule)

Other ingredients: mulberry, canavaliae semen, almond, inulin, fructooligosaccharide.

2. Probiotics and Arthritis

Studies have shown that increased intestinal permeability and inflammation, both fueled by dysbiosis, appear to contribute to arthritis pathogenesis, because the leaked microbes and metabolites can migrate to the peripheral joints, leading to immune responses and synovitis in peripheral joints. The abundance and diversity of gut microflora decline as arthritis progresses, and intestinal dysbiosis further aggravate the inflammatory response. Supplementation of probiotics can

not only improve the arthritis disease activity score, reduce the level of C-reactive protein, but also enhance the activity of regulatory T cells (Treg) and reduce the release of inflammatory factors in arthritis mice. Therefore, the regulation of intestinal microflora has become a new strategy for the treatment of arthritis.

Table 1. Common arthritis therapies

Therapy	Pros & Cons
Surgery	Costly
Use arthritis drugs	Side effects
Use probiotics	Safe and effective without side effects

3. Probiotic Mechanisms Affecting Arthritis

Probiotics can reduce intestinal permeability, enhance the immune response of secreted immunoglobulin A (IgA) to pathogens, limit the proliferation of pathogens, and reduce the release of pro-inflammatory cytokines (TNF-α).

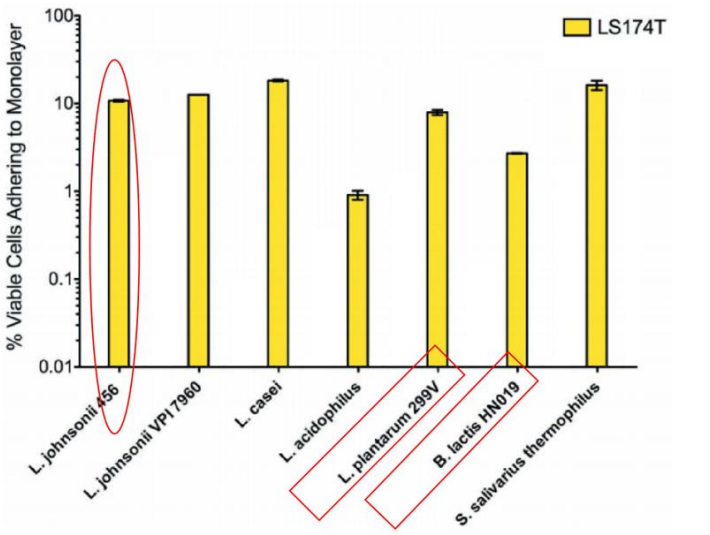
4. Screening of Functional Probiotic Strains

L. johnsonii LBJ 456® was isolated from wild-type mice with restricted gut microflora. It was previously demonstrated to have anti-inflammatory and anti-genotoxic effects in a mouse model.

5. About LBJ 456®

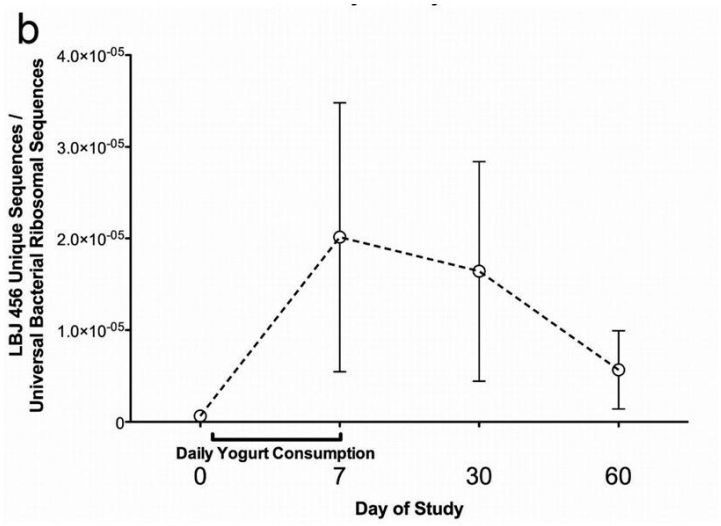
Adhesion

Bacterial adhesion to the intestinal epithelium, as well as the associated mucus secretions, has long been considered an important probiotic criterion. Adhesion of LBJ 456® to LS 174T was observed to a greater extent than the commercially available probiotic strains *L. plantarum* 299V and *B. lactis* HN019.



Colonization

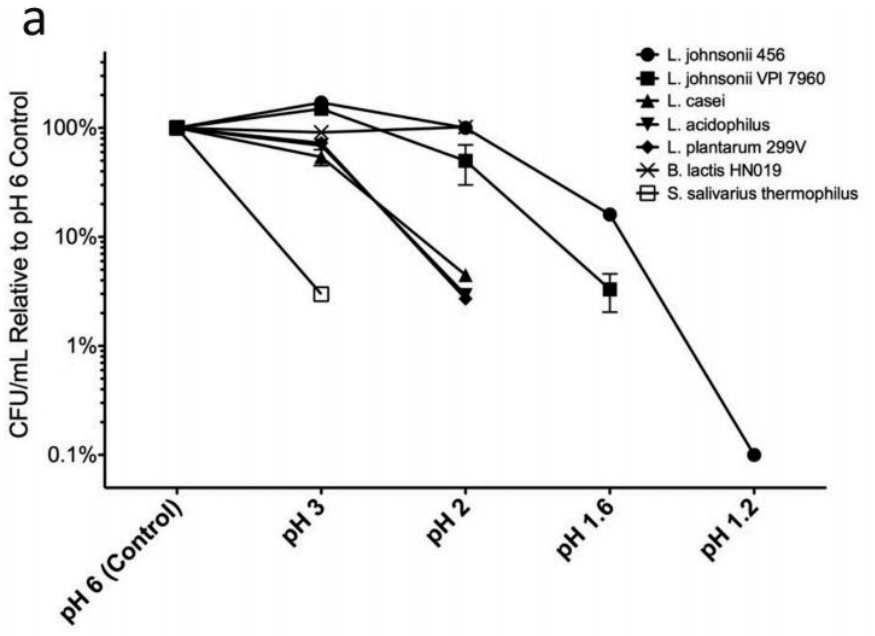
A 7 day course of LBJ 456® yogurt leads to elevations in both total lactic acid bacteria(LAB) and LBJ 456® specific DNA. The latter was still detectable at 60 days, showing that LBJ 456® was capable of long-term survival in the human gut.



Acid Resistance

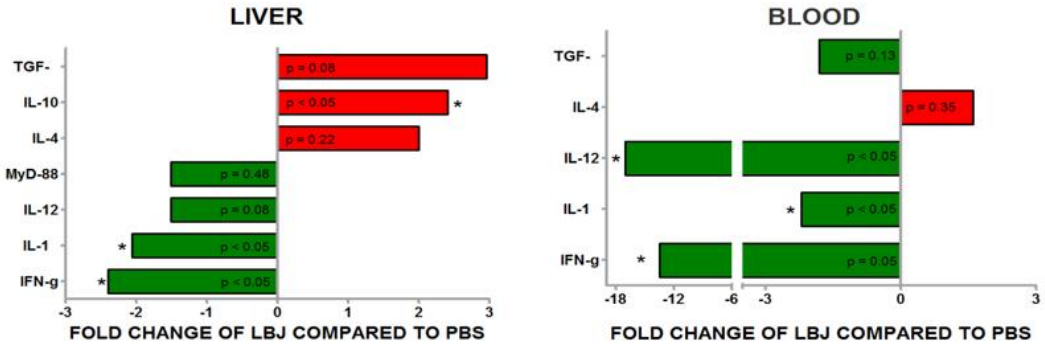
To assess LBJ 456®'s viability in the GI tract, we compared its relative tolerance to simulated gastric acid against a panel of type strains representing commonly used probiotic species. The viability of LBJ 456® in particular was consistently

the highest at all pH conditions tested. Importantly, LBJ 456® was also the only strain to show viability at pH 1.2.



6. Anti-inflammatory Effects of LBJ 456®

In animal study, LBJ 456® was shown to modulate levels of pro-inflammatory cytokines and anti-inflammatory cytokines in liver and blood.



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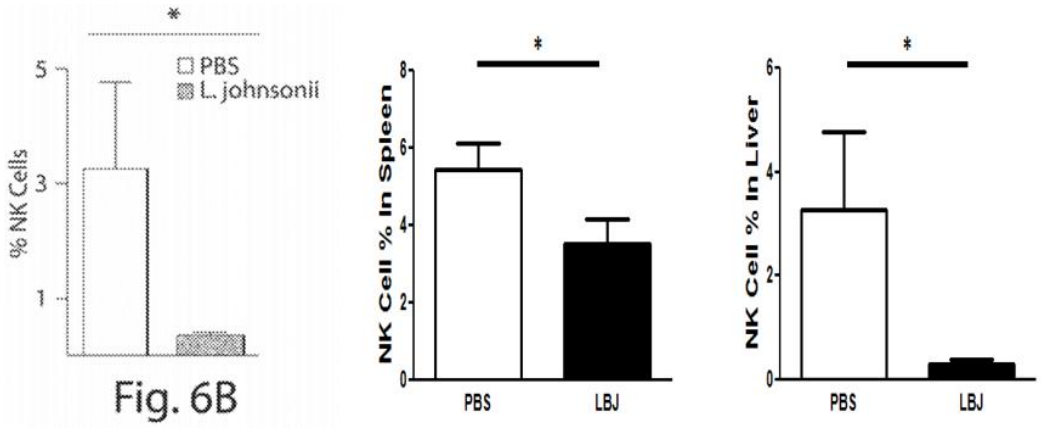
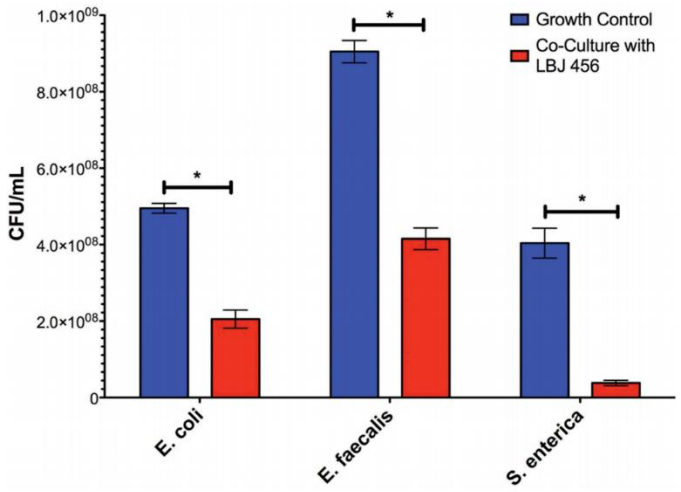
LBJ 456® treatment also resulted in a reduction in the abundance of hepatic and migratory (blood, splenic) NK and T cells.



Meanwhile, Co-culture with LBJ 456® significantly inhibited growth of pathogenic strains, resulting in lower risk of inflammation caused by pathogen infection.



7. Other Ingredients

Mulberry: The different parts of mulberry are rich in flavonoids and exert anti-inflammatory and anti-oxidative activities

Canavaliae semen: it has been traditionally used to treat inflammatory diseases by reducing the nitric oxide production and decreasing mRNA and protein expression of inflammatory mediates (inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 (COX-2)), and inhibiting the phosphorylation of nuclear factor kappa B, a major signaling molecule in the inflammatory response.

Almond: As a popular food snack rich in protein, fiber, unsaturated fatty acids, antioxidants and multiple micronutrients (vitamin E, magnesium, riboflavin, copper, niacin, and manganese), almond nut consumption is widely associated with anti-inflammatory effects.

Inulin, fructooligosaccharide: prebiotics.