

Lactobacillus casei Shirota: key studies

Lactobacillus casei Shirota (LcS) is the unique probiotic strain in Yakult

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1. Infectious diarrhoea and antibiotic-associated diarrhoea

Use of probiotics in preventing antibiotic-associated diarrhoea and *Clostridium difficile* associated diarrhoea in spinal injury centres: an international multicentre study. Wong S, Saif M, O'Driscoll J *et al* (2015) *International Journal of Probiotics Prebiotics* **10**(23):85-90.

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Effects of the continuous intake of *Lactobacillus casei* strain Shirota-fermented milk on risk management of long-term inpatients at health service facilities for the elderly. Bian L, Nagata S, Asahara T *et al* (2011) *International Journal of Probiotics and Prebiotics* **6**(2):123-132.
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Effects of perioperative synbiotic treatment on infectious complications, intestinal integrity and faecal flora and organic acids in hepatic surgery with or without cirrhosis. Usami M, Miyishi M, Kanbara Y *et al* (2011) *Journal of Parenteral and Enteral Nutrition* **15**:317-328.
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Clinical effect of biolactis powder, a *Lactobacillus casei* preparation, on rotavirus-induced pediatric enteritis. Sugita T & Togawa M (1994) *Japanese Journal of Pediatrics* **47**:2755-2762.

2. Other infections

Daily fermented milk with *Lactobacillus casei* strain Shirota reduces the incidence and duration of upper respiratory tract infections in healthy middle-aged office workers. Shida K, Sato T, liuzka R *et al* (2017) *European Journal of Nutrition* **56**(1): 45-53
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The effectiveness of *Lactobacillus* beverage in controlling infections among the residents of an aged care facility: a randomized placebo-controlled double-blind trial. Nagata S, Asahara T, Wang C, Suyama Y *et al* (2016) *Annals of Nutrition & Metabolism* **68**(1):51-59.
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Fermented milk containing *Lactobacillus casei* strain Shirota prevents the onset of physical symptoms in medical students under academic examination stress. Kato-Katoaka A, Nishida K, Takada M *et al* (2016) *Beneficial Microbes* **7**(2):153-156.
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***In vitro* and *in vivo* inhibition of *Helicobacter pylori* by *Lactobacillus casei* strain Shirota.** Sgouras D, Maragkoudakis P, Petraki K *et al* (2004) *Applied & Environmental Microbiology* **70**(1):518-26.

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Effect of frequent consumption of a *Lactobacillus casei*-containing milk drink in *Helicobacter pylori*-colonized subjects. Cats A, Kuipers EJ, Bosscherts MAR *et al* (2003) *Alimentary Pharmacology & Therapeutics* **17**(3):429-435.

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3. Gut function (e.g. IBS, constipation, IBD, NEC, liver)

Fermented milk containing *Lactobacillus casei* strain Shirota preserves the diversity of the gut microbiota and relieves abdominal dysfunction in healthy medical students exposed to academic stress. Kato-Katoaka A, Nishida K, Takada M *et al* (2016) *Applied and Environmental Microbiology* **82**(12):3649-58.

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Efficacy of *Lactobacillus casei* Shirota for patients with irritable bowel syndrome. Thijssen AY, Clemens CH, Vankerckhoven V *et al* (2015) *European Journal of Gastroenterology & Hepatology* **28**(1):8-14.

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A probiotic fermented milk drink containing *Lactobacillus casei* strain Shirota improves stool consistency of subjects with hard stools. Tilley L, Keppens K, Kushiro A *et al* (2014) *Int J Probiotics Prebiotics* **9**(1/2):23-30.

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4. **Metabolic risk factors** (e.g. insulin resistance, blood pressure)

Habitual intake of fermented milk products containing *Lactobacillus casei* strain Shirota and a reduced risk of hypertension in older people. Aoyagi Y, Park S, Matsubara S *et al* (2016) *Beneficial Microbes* **8**(1): 23-29.

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5. **Cancer**

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6. Immune function

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Flexible cytokine production by macrophages and T cells in response to probiotic bacteria.

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Suppressive effect on activation of macrophages by *Lactobacillus casei* strain Shirota genes determining the synthesis of cell wall-associated polysaccharides. Yasuda E, Serata M, Sako T (2008) *Applied & Environmental Microbiology* **74**(15):4746-4755.
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7. Miscellaneous (e.g. safety, gut survival, enteral feed, sports, oral, reduction of harmful substances, etc)

Beneficial effects of *Lactobacillus casei* strain Shirota on academic stress-induced sleep disturbance in healthy adults: a double-blind, randomised, placebo-controlled trial. Takada M, Nishida K, Gondo Y *et al* (2017) *Beneficial Microbes* **8**(2):153-162
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