

BIFIDOBACTERIUM ANIMALIS SSP. LACTIS HN019™

Bifidobacterium lactis and *Bifidobacterium animalis* subsp. *lactis* refer to the same species. The strain designations HN019 and DR10 refer to the same strain. HN019 has been referred to as HOWARU Bifido, HOWARU *B. bifidum* (in Ding&Shah, 2009 and 2010) and HOWARU *Bifidobacterium lactis*.

In vitro trials

Probiotic selection, survival, stability

1. Klindt-Toldam S, Larsen SK, Saaby L, Olsen LR, Svenstrup G, Müllertz A, Knöchel S, Heimdal H, Nielsen DS, Zielinska D. 2016. Survival of *Lactobacillus acidophilus* NCFM and *Bifidobacterium lactis* HN019 encapsulated in chocolate during *in vitro* simulated passage of the upper gastrointestinal tract. *LWT-Food Sci Technol.* Jul 25.
2. Wang XF, Tian F, Cao RM, Li J, Wu SM, Guo XK, Chen TX. 2015. Antimicrobial activity of human β -defensins against lactic acid bacteria. *Nat Prod Res.* 6: 1-3.
3. Barrangou R, Briczinski EP, Treager LL, Loquasto JR, Richards M, Hovarth P, Coute-Monvoisin AC, Leyer G, Rendulic S, Steele JL, Broadbent JR, Oberg T, Dudley EG, Schuster S, Romero D, Roberts RF. 2009. Comparison of the complete genome sequences of *Bifidobacterium animalis* subsp. *lactis* DSM 10140 and BI-04. *J Bacteriol.* 191: 4144-4151.
4. Briczinski EP, Loquasto JR, Barrangou R, Dudley EG, Roberts AM, Roberts RF. 2009. Strain-specific genotyping of *Bifidobacterium animalis* subsp. *lactis* by using single-nucleotide polymorphisms, insertions and deletions. *Appl Environ Microbiol.* 75: 7501-7508.
5. Prasad J, Gill H, Smart J, Gopal PK. 1998. Selection and characterization of *Lactobacillus* and *Bifidobacterium* strains for use as probiotics. *Int Dairy J.* 8: 993-1002.

Safety

1. Zhou JS, Pillidge CJ, Gopal PK, Gill HS. 2005. Antibiotic susceptibility profiles of new probiotic *Lactobacillus* and *Bifidobacterium* strains. *Int J Food Microbiol.* 98: 211-217.
2. Zhou JS, Rutherford KJ, Gill HS. 2005. Inability of probiotic bacterial strains *Lactobacillus rhamnosus* HN001 and *Bifidobacterium lactis* HN019 to induce human platelet aggregation *in vitro*. *J Food Prot.* 68: 2459-2464.
3. Zhou JS, Gopal PK, Gill HS. 2001. Potential probiotic lactic acid bacteria *Lactobacillus rhamnosus* (HN001), *Lactobacillus acidophilus* (HN017) and *Bifidobacterium lactis* (HN019) do not degrade gastric mucin *in vitro*. *Int J Food Microbiol.* 63: 81-90.

Antipathogenic/antitoxic activity

1. Liu C, Zhang ZY, Dong K, Guo XK. 2010. Adhesion and immunomodulatory effects of *Bifidobacterium lactis* HN019 on intestinal epithelial cells INT-407. *World J Gastroenterol.* 16: 2283-2290.
2. Gopal PK, Prasad J, Smart J, Gill HS. 2001. *In vitro* adherence properties of *Lactobacillus rhamnosus* DR20 and *Bifidobacterium lactis* DR10 strains and their antagonistic activity against an enterotoxigenic *Escherichia coli*. *Int J Food Microbiol.* 67: 207-216.

Intestinal permeability

1. Anderson RC, Cookson AL, McNabb WC, Kelly WJ, Roy NC. 2010. *Lactobacillus plantarum* DSM 2648 is a potential probiotic that enhances intestinal barrier function. *FEMS Microbiol Lett.* [Epub ahead of print]
2. Putaala H, Salusjärvi T, Nordström M, Saarinen M, Ouwehand AC, Bech Hansen, E, Rautonen N. 2008. Effect of four probiotic strains and *Escherichia coli* O157:H7 on tight junction integrity and cyclo-oxygenase expression. *Res Microbiol.* 159: 692-698.

Adherence

1. Gopal PK, Prasad J, Smart J, Gill HS. 2001. *In vitro* adherence properties of *Lactobacillus rhamnosus* DR20 and *Bifidobacterium lactis* DR10 strains and their antagonistic activity against an enterotoxigenic *Escherichia coli*. Int J Food Microbiol. 67: 207-216.

Toxin removal

1. Nybom SMK, Salminen SJ, Meriluoto JAO. 2007. Removal of microcystin-LR by strains of metabolically active probiotic bacteria. FEMS Microbiol Lett. 270: 27-33.

Prebiotic utilization

1. Sims IM, Ryan JL, Kim SH. 2014. *In vitro* fermentation of prebiotic oligosaccharides by *Bifidobacterium lactis* HN019 and *Lactobacillus* spp. Anaerobe 25: 11-17
2. Mäkeläinen H, Saarinen M, Stowell J, Rautonen N and Ouwehand AC. 2010. Xylo-oligosaccharides and lactitol promote the growth of *Bifidobacterium lactis* and *Lactobacillus* species in pure cultures. Beneficial Microbes 1: 139-148.
3. Mäkeläinen H, Hasselwander O, Rautonen N, Ouwehand AC. 2009. Panose, a new prebiotic candidate. Lett Appl Microbiol. 49: 666-672.
4. Gopal PK, Sullivan PA, Smart BJ. 2001. Utilisation of galacto-oligosaccharides as selective substrates for growth by lactic acid bacteria including *Bifidobacterium lactis* DR10 and *Lactobacillus rhamnosus* DR20. Int Dairy J. 11: 19-25

Animal trials

Safety

1. Zhou JS, Gill HS. 2005. Immunostimulatory probiotic *Lactobacillus rhamnosus* HN001 and *Bifidobacterium lactis* HN019 do not induce pathological inflammation in mouse model of experimental autoimmune thyroiditis. Int J Food Microbiol. 103: 97-104.
2. Zhou JS, Shu Q, Rutherfurd KJ, Prasad J, Birtles MJ, Gopal PK, Gill HS. 2000. Safety assessment of potential probiotic lactic acid bacterial strains *Lactobacillus rhamnosus* HN001, *Lb. acidophilus* HN017 and *Bifidobacterium lactis* HN019 in BALB/c mice. Int J Food Microbiol. 56: 87-96.

3. Zhou JS, Shu Q, Rutherfurd KJ, Prasad J, Gopal PK, Gill HS. 2000. Acute oral toxicity and bacterial translocation studies on potentially probiotic strains of lactic acid bacteria. Food Chem Toxicol. 38: 153-161.

4. Shu Q, Zhou JS, Rutherfurd KJ, Birtles MJ, Prasad J, Gopal PK, Gill HS. 1999. Probiotic lactic acid bacteria *Lactobacillus acidophilus* HN017, *Lactobacillus rhamnosus* HN001 and *Bifidobacterium lactis* HN019) have no adverse effects on the health of mice. Int Dairy J. 9: 831-836.

Immune system enhancement

1. He X, Slupsky CM, Dekker JW, Haggarty NW, Lönnerdal B. 2016. Integrated Role of *Bifidobacterium animalis* subsp. *lactis* Supplementation in Gut Microbiota, Immunity and Metabolism of Infant Rhesus Monkeys. mSystems. 1(6). pii: e00128-16.
2. Gill HS, Rutherfurd KJ, Prasad J, Gopal PK. 2000. Enhancement of natural and acquired immunity by *Lactobacillus rhamnosus* HN001, *Lactobacillus acidophilus* HN017 and *Bifidobacterium lactis* HN019. Br J Nutr. 83: 167-176.
3. Shu Q, Qu F, Lin K, Rutherfurd K J, Zhou J, Gill H S. 1999. *Bifidobacterium lactis* HN019 enhances host immunity and resistance to gastrointestinal pathogens. In: Food microbiology and food safety into the next millennium. Tuijelaars ACJ, Samson RA, Rombouts FM, Notermans S (eds). Wageningen, the Netherlands: Foundation Food Micro '99, pp. 858-861.
Also listed under Antipathogenic activity.

Oral health

1. Oliveira LF, Salvador SL, Silva PH, Furlaneto FA, Figueiredo L, Casarin R, Ervolino E, Palioto DB, Souza SL, Taba M Jr, Novaes AB Jr, Messoria MR. 2016. Benefits of *Bifidobacterium animalis* subsp. *lactis* Probiotic in Experimental Periodontitis. J Periodontol. 23: 1-20.

Antipathogenic activity

1. Shu Q, Gill HS. 2001. A dietary probiotic (*Bifidobacterium lactis* HN019) reduces the severity of *Escherichia coli* 0157:H7 infection in mice. Med Microbiol Immunol. 189: 147-152.
2. Shu Q, Qu F, Gill HS. 2001. Probiotic treatment using *Bifidobacterium lactis* HN019 reduces weanling diarrhea associated with rotavirus and *Escherichia coli* infection in a piglet model. J Ped Gastroenterol Nutr 33: 171-177.

3. Shu Q, Lin H, Rutherford KJ, Fenwick SG, Prasad J, Gopal PK, Gill HS. 2000. Dietary *Bifidobacterium lactis* HN019 enhances resistance to oral *Salmonella typhimurium* infection in mice. *Microbiol Immunol.* 44: 213-222.

4. Shu Q, Qu F, Lin K, Rutherford KJ, Zhou J, Gill HS. 1999. *Bifidobacterium lactis* HN019 enhances host immunity and resistance to gastrointestinal pathogens. In: Food microbiology and food safety into the next millenium. Tuijtelars ACJ, Samson RA, Rombouts FM, Notermans S (eds). Wageningen, the Netherlands: Foundation Food Micro '99, pp. 858-861.

Also listed under Immune system enhancement.

Diabetes

1. Al-Salami H, Butt G, Fawcett JP, Tucker IG, Golocorbin-Kon S, Mikov M. 2008. Probiotic treatment reduces blood glucose levels and increases systemic absorption of gliclazide in diabetic rats. *Eur J Drug Metab Phama.* 33: 101-106.

2. Al-Salami H, Butt G, Tucker IG, Skrbic R, Golocorbin-Kon S, Mikov M. 2008. Probiotic pre-treatment reduces gliclazide permeation (*ex vivo*) in healthy rats but increases it in diabetic rats to the level seen in untreated healthy rats. *Arch Drug Info.* 1: 35-41.

Nonalcoholic fatty liver disease

1. Alves CC, Waitzberg DL, de Andrade LS, Dos Santos Aguiar L, Reis MB, Guanabara CC, Júnior OA, Ribeiro DA, Sala P. 2017. Prebiotic and Synbiotic Modifications of Beta Oxidation and Lipogenic Gene Expression after Experimental Hypercholesterolemia in Rat Liver. *Front. Microbiol.* 8: 2010. doi: 10.3389/fmicb.2017.02010.

2. Tagliari E, Campos AC, Costa-Casagrande TA, Salvalaggio PR. 2017. The impact of the use of symbiotics in the progression of nonalcoholic fatty liver disease in a rat model. *ABCD Arq Bras Cir Dig Original Article* 30(3): 211-215. DOI: /10.1590/0102-6720201700030011.

Gastrointestinal function

1. Dalziel JE, Anderson RC, Peters JS, Lynch AT, Spencer NJ, Dekker J, Roy NC. 2017. Promotility Action of the Probiotic *Bifidobacterium lactis* HN019 Extract Compared with Prucalopride in Isolated Rat Large Intestine. *Front. Neurosci.* 11: 20. doi: 10.3389/fnins.2017.00020.

Human clinical studies

Safety

1. Wibowo N, Bardosono S, Irwinda R. 2016. Effects of *Bifidobacterium animalis* subsp. *lactis* HN019 (DR10), inulin and micronutrient fortified milk on faecal DR10, immune markers and maternal micronutrients among Indonesian pregnant women. *Asia Pac J Clin Nutr.* Dec;25(Suppl 1): S102-S110.

2. Dekker JW, Wickens K, Black PN, Stanley TV, Mitchell EA, Fitzharris P, Tannock GW, Purdie G, Crane J. 2009. Safety aspects of probiotic bacterial strains *Lactobacillus rhamnosus* HN001 and *Bifidobacterium animalis* subsp. *lactis* HN019 in human infants aged 0–2 years. *Int Dairy J.* 19: 149–154.

Immune system enhancement

1. Bernini LJ, Simão AN, Alfieri DF, Lozovoy MA, Mari NL, de Souza CH, Dichi I, Costa GN. 2016. Beneficial effects of *Bifidobacterium lactis* on lipid profile and cytokines in patients with metabolic syndrome: A randomized trial. Effects of probiotics on metabolic syndrome. *Nutrition* 32(6): 716-9.

Also listed under General health/Nutritional status.

2. Marlow G, Han DY, Wickens K, Stanley T, Crane J, Mitchell EA, Dekker J, Barthow C, Fitzharris P, Ferguson LR, Morgan AR. 2015. Differential effects of two probiotics on the risks of eczema and atopy associated with single nucleotide polymorphisms to Toll-like receptors. *Pediatr Allergy Immunol.* 26(3): 262-71.

3. Prescott SL, Wickens K, Westcott L, Jung W, Currie H, Black PN, Stanley TV, Mitchell EA, Fitzharris P, Siebers R, Wu L, Crane J. 2008. Supplementation with *Lactobacillus rhamnosus* or *Bifidobacterium lactis* probiotics in pregnancy increases cord blood interferon-gamma and breast milk transforming growth factor-beta and immunoglobulin A detection. *Clin Exp Allergy* 38, 1606-1614.

4. Gill HS, Rutherford KJ, Cross ML. 2001. Dietary probiotic supplementation enhances natural killer cell activity in the elderly: an investigation of age-related immunological changes. *J Clin Immunol.* 21: 264-271.

5. Gill H, Rutherford K J, Cross M L, Gopal P K. 2001. Enhancement of immunity in the elderly by dietary supplementation with the probiotic *Bifidobacterium lactis* HN019. *Am J Clin Nutr.* 74: 833-839.
6. Arunachalam K, Gill HS, Chandra RK. 2000. Enhancement of natural immune function by dietary consumption of *Bifidobacterium lactis* HN019. *Eur J Clin Nutr.* 54: 263-267.
7. Chiang B L, Sheih Y H, Wang L H, Liao C K, Gill H S. 2000. Enhancing immunity by dietary consumption of a probiotic lactic acid bacterium *Bifidobacterium lactis* HN019: optimization and definition of cellular immune responses. *Eur J Clin Nutr.* 54: 849-855.

Gastrointestinal functionality

1. Ibarra A, Latreille-Barbier M, Donazzolo Y, Pelletier X, Ouwehand AC. 2018. Effects of 28-day *Bifidobacterium animalis* subsp. *lactis* HN019 supplementation on colonic transit time and gastrointestinal symptoms in adults with functional constipation: A double-blind, randomized, placebo-controlled, and dose-ranging trial. *Gut Microbes* 11:1-16. doi: 10.1080/19490976.2017.1412908.
2. Hemalatha R, Ouwehand AC, Forssten SD, Geddan JJB, Mamidi RS, Bhaskar V and Radhakrishna KV. 2014. A Community-based Randomized Double Blind Controlled Trial of *Lactobacillus paracasei* and *Bifidobacterium lactis* on Reducing Risk for Diarrhea and Fever in Preschool Children in an Urban Slum in India. *European Journal of Nutrition & Food Safety* 4(4): 325-341.
Also listed under Gastrointestinal ecology.
3. Magro DO, de Oliveira LM, Bernasconi I, Ruela Mde S, Credidio L, Barcelos IK, Leal RF, Ayrizono Mde L, Fagundes JJ, Teixeira Lde B, Ouwehand AC, Coy CS. 2014. Effect of yogurt containing polydextrose, *Lactobacillus acidophilus* NCFM and *Bifidobacterium lactis* HN019: a randomized, double-blind, controlled study in chronic constipation. *Nutr J.* 24;13: 75.
4. Waller PA, Gopal PK, Leyer GJ, Ouwehand AC, Reifer C, Stewart ME, Miller LE. 2011. Dose-response effect of *Bifidobacterium lactis* HN019 on whole gut transit time and functional gastrointestinal symptoms in adults. *Scand J Gastroenterol.* 9: 1057-1064.

Synbiotic

1. Aoe S, Nakazawa Y, Ohmisa S. 2017. Combined effect of a probiotic (*Bifidobacterium*) and a prebiotic (polydextrose) on the fecal microbiota and stool parameters of healthy young women. *Integrative Molecular Medicine* 4(5): 1-5.
2. Magro DO, de Oliveira LM, Bernasconi I, Ruela Mde S, Credidio L, Barcelos IK, Leal RF, Ayrizono Mde L, Fagundes JJ, Teixeira Lde B, Ouwehand AC, Coy CS. 2014. Effect of yogurt containing polydextrose, *Lactobacillus acidophilus* NCFM and *Bifidobacterium lactis* HN019: a randomized, double-blind, controlled study in chronic constipation. *Nutr J.* 24;13: 75.
3. Waitzberg DL, Logullo LC, Bittencourt AF, Torrinhas RS, Shiroma GM, Paulino NP, Teixeira-da-Silva ML. 2013. Effect of synbiotic in constipated adult women – A randomized, double-blind, placebo-controlled study of clinical response. *Clinical Nutrition* 32: 27-33.

General health/Nutritional status

1. Bernini LJ, Simão AN, Alfieri DF, Lozovoy MA, Mari NL, de Souza CH, Dichi I, Costa GN. 2016. Beneficial effects of *Bifidobacterium lactis* on lipid profile and cytokines in patients with metabolic syndrome: A randomized trial. Effects of probiotics on metabolic syndrome. *Nutrition* 32(6): 716-9.
Also listed under Immune system enhancement.
2. Sazawal S, Dhingra U, Hiremath G, Sarkar A, Dhingra P, Dutta A, Verma P, Menon P, Black RE. 2010. Prebiotic and probiotic fortified milk in prevention of morbidities among children: Community-based, randomized, double-blind, controlled trial. *PLoS ONE* 5: e12164.
3. Sazawal S, Dhingra U, Hiremath G, Sarkar A, Dhingra P, Dutta A, Menon VP, Black RE. 2010. Effects of *Bifidobacterium lactis* HN019 and Prebiotic Oligosaccharide Added to Milk on Iron Status, Anemia and Growth Among Children 1 to 4 Years: A Community-based, Randomized, Double-masked, Controlled Trial. *Journal of Pediatric Gastroenterology and Nutrition.* 51: 341-346.
4. Sarkar A, Sazawal S, Dhingra U, Dhingra P, Sood M, Verma P, Juyal R, Kumar J, Menon VP, Black M, Black RE. 2004. Effect of fortification of milk with probiotic *Bifidobacterium lactis* HN019 (DR-10) and galacto-oligosaccharides on anemia, growth and development in children aged 1-4 years - A double masked randomized trial. pp. 59-63. 3-7-2004. Paris, ESPGHAN.

5. Sazawal S, Dhingra U, Sarkar A, Dhingra P, Deb S, Marwah D, Menon V P, Kumar J, Black RE. 2004. Efficacy of milk fortified with a probiotic *Bifidobacterium lactis* DR-10 and prebiotic galacto-oligosaccharides in prevention of morbidity and on nutritional status. *Asia Pac J Clin Nutr.* 13: S28.

Allergy treatment

1. Morgan AR, Han DY, Wickens K, Barthow C, Mitchell EA, Stanley TV, Dekker J, Crane J, Ferguson LR. 2014. Differential modification of genetic susceptibility to childhood eczema by two probiotics. *Clin Exp Allergy.*

2. Campbell DE. 2013. Probiotics and primary prevention of atopic disease: Are we closer to a firm evidence base for clinical use? *Clin Exp Allergy.* 43: 978-980. [Editorial]

3. Wickens K, Stanley TV, Mitchell EA, Barthow C, Fitzharris P, Purdie G, Siebers R, Black PN, Crane J. 2013. Early supplementation with *Lactobacillus rhamnosus* HN001 reduces eczema prevalence to 6 years: does it also reduce atopic sensitization? *Clin Exp Allergy.* 43(9): 1048-57.

4. Wickens K, Black, P, Stanley TV, Mitchell E, Barthow C, Fitzharris P, Purdie G and Crane J. 2012. A protective effect of *Lactobacillus rhamnosus* HN001 against eczema in the first 2 years of life persists to age 4 years. *Clin Exp Allergy.* 42: 1071-1079. [Editorial included as separate pdf file]

5. Wickens K, Black PN, Stanley TV, Mitchell E, Fitzharris P, Tannock GW, Purdie G, Crane J; Probiotic Study Group. 2008. A differential effect of 2 probiotics in the prevention of eczema and atopy: A double-blind, randomized, placebo controlled trial. *J Allergy Clin Immunol.* 122: 788-94.

6. Sistik D, Kelly R, Wickens K, Stanley T, Fitzharris P, Crane J. 2006. Is the effect of probiotics on atopic dermatitis confined to food sensitized children? *Clin Exp Allergy.* 36: 629-633.

Gastrointestinal ecology

1. Hemalatha R, Ouwehand AC, Forssten SD, Geddan JJB, Mamidi RS, Bhaskar V and Radhakrishna KV. 2014. A Community-based Randomized Double Blind Controlled Trial of *Lactobacillus paracasei* and *Bifidobacterium lactis* on Reducing Risk for Diarrhea and Fever in Preschool Children in an Urban Slum in India. *European Journal of Nutrition & Food Safety* 4(4): 325-341.

Also listed under Gastrointestinal functionality.

2. Oswari H, Prayitno L, Dwipoerwantoro PG, Firmansyah A, Makrides M, Lawley B, Kuhn-Sherlock B, Cleghorn G, Tannock GW. 2013. Comparison of stool microbiota compositions, stool alpha1-antitrypsin and calprotectin concentrations and diarrhoeal morbidity of Indonesian infants fed breast milk or probiotic/prebiotic-supplemented formula. *J Paediatr Child Health.* 49(12): 1032-1039.

3. Prasad J, Sazawal S, Dhingra U, Gopal PK. 2013. Detection of viable *Bifidobacterium lactis* HN019 (DR10) in stools of children during a synbiotic dietary intervention trial. *Int Dairy J* 30: 64-67.

4. Ahmed M, Prasad J, Gill HS, Stevenson L, Gopal PK. 2007. Impact of consumption of different levels of *Bifidobacterium lactis* HN019 on the intestinal microflora of elderly human subjects. *J Nutr.* 11: 26-31.

5. Gopal P, Prasad J, Gill HS. 2003. Effects of the consumption of *Bifidobacterium lactis* HN019 (DR10) and galacto-oligosaccharides on the microflora of the gastrointestinal tract in human subjects. *Nutr Res.* 23: 1313-1328.

Product functionality

1. Toh M, Liu SQ. 2017. Impact of coculturing *Bifidobacterium animalis* subsp. *lactis* HN019 with yeasts on microbial viability and metabolite formation. *J Appl Microbiol.* 123 (4): 956-968. doi: 10.1111/jam.13571.

2. Blanco-Miguez A, Gutierrez-Jacome F, Fdez-Riverola F, Lourenco A and Sanchez B. 2016. 'A peptidome-based phylogeny pipeline reveals differential peptides at the strain level within *Bifidobacterium animalis* subsp. *lactis*. *Food Microbiol.* 60: 137-41.

3. Zarić DB, Bulatović ML, Rakin MB, Krunić TŽ, Lončarević IS, Pajind BS. 2016. Functional, rheological and sensory properties of probiotic milk chocolate produced in a ball mill. *RSC Adv.* 6: 13934-13941.

4. Yeo AY, Toh MZ, Liu SQ. 2015. Enhancement of bifidobacteria survival by *Williopsis saturnus* var. *saturnus* in milk. *Benef Microbes.* 30: 1-10.

5. Jers C, Michalak M, Larsen DM, Kepp KP, Li H, Guo Y, Kirpekar F, Meyer AS, Mikkelsen JD. 2014. Rational design of a new *Trypanosoma rangeli* trans-sialidase for efficient sialylation of glycans. PLoS One 9(1): e83902. doi: 10.1371/journal.pone.0083902.
 6. Michalak M, Thomassen LV, Roytio H, Ouwehand AC, Meyer AS, Mikkelsen JD. 2012. Expression and characterization of an endo-1,4- β -galactanase from *Emericella nidulans* in *Pichia pastoris* for enzymatic design of potentially prebiotic oligosaccharides from potato galactans. Enzyme Microb Technol. 50(2): 121-129. doi: 10.1016/j.enzmictec.2011.11.001.
 7. do Espírito Santo AP, Perego P, Converti A, Oliveira MN. 2012. Influence of milk type and addition of passion fruit peel powder on fermentation kinetics, texture profile and bacterial viability in probiotic yoghurts. LWT - Food Science and Technology. 47: 393e399.
 8. Florence AC, Béal C, Silva RC, Bogsan CS, Pilleggi AL, Gioielli LA, Oliveira MN. 2012. Fatty acid profile, trans-octadecenoic, α -linolenic and conjugated linoleic acid contents differing in certified organic and conventional probiotic fermented milks. Food Chem. 135(4): 2207-14.
 9. Florence ACR, Oliveira RPS, Silva RC, Soares FASM, Gioielli LA, Oliveira MN. 2012. Organic milk improves *Bifidobacterium lactis* counts and bioactive fatty acids contents in fermented milk. LWT - Food Science and Technology 49: 89e95.
 10. Kolakowski and Pawlikowska. 2012. Kefir as a probiotic delivery vehicle. Milchwissenschaft 67: 2.
 11. do Espírito Santo AP, Cartolano NS, Silva TF, Soares FA, Gioielli LA, Perego P, Converti A, Oliveira MN. 2011. Fibers from fruit by-products enhance probiotic viability and fatty acid profile and increase CLA content in yoghurts. Int J Food Microbiol.
 12. Shah NP, Ding WK, Fallourd MJ, Leyer G. 2010. Improving the stability of probiotic bacteria in model fruit juices using vitamins and antioxidants. J Food Sci. 75: M278-82.
 13. Ding WK, Shah NP. 2010. Enhancing the biotransformation of isoflavones in soymilk supplemented with lactose using probiotic bacteria during extended fermentation. J. Food Sci. 75: M140-M149.
 14. Ding WK, Shah NP. 2009. Effect of various encapsulating materials on the stability of probiotic bacteria. J Food Sci. 74(2): M100-7.
 15. Phillips M, Kailasapathy K, Tran L. 2006. Viability of commercial probiotic cultures (*L. acidophilus*, *Bifidobacterium* sp., *L. casei*, *L. paracasei* and *L. rhamnosus*) in cheddar cheese. International Journal of Food Microbiology 108: 276–280.
- ## Reviews
1. Miler LE, Ouwehand AC, Ibarra A. 2017. Effects of probiotic-containing products on stool frequency and intestinal transit in constipated adults: systematic review and meta-analysis of randomized controlled trials. Ann Gastroenterol. 30 (6): 629-639. doi: 10.20524/aog.2017.0192.
 2. Miller LE, Zimmermann AK, Ouwehand AC. 2016. Contemporary meta-analysis of short-term probiotic consumption on gastrointestinal transit. World J Gastroenterol. 22(21): 5122-5131.
 3. Dimidi E, Christodoulides S, Fragkos KC, Scott SM, Whelan K. 2014. The effect of probiotics on functional constipation in adults: a systematic review and meta-analysis of randomized controlled trials. Am J Clin Nutr. 100(4): 1075-84.
 4. Miller LE, Ouwehand AC. 2013. Probiotic supplementation decreases intestinal transit time: Meta-analysis of randomized controlled trials. World J Gastroenterol. 19(29): 4718-25.
 5. Lahtinen SJ, Kumar R. 2009. Probiotics improve immune system function. Indian Dairyman. 61: 49-54.
 6. Ouwehand AC, Lahtinen S, Nurminen P. 2009. *Lactobacillus rhamnosus* HN001 and *Bifidobacterium lactis* HN019. In Handbook of probiotics and prebiotics. Lee YK, Salminen S (eds). John Wiley & Sons, New Jersey, 2nd edition, pp. 473-477.
 7. Gill H, Prasad J. 2008. Probiotics, immunomodulation and health benefits. Adv Exp Med Biol. 606: 423-454.
 8. Dekker J, Collett M, Prasad J, Gopal P. 2007. Functionality of Probiotics – Potential for Product Development. In Nutrigenomics - Opportunities in Asia. Tai ES, Gillies PJ (eds). Forum Nutr. Basel, Karger, vol. 60, pp. 196-208.

9. Sanders ME. 2006. Summary of probiotic activities of *Bifidobacterium lactis* HN019. J Clin Gastroenterol. 40: 776-783.
10. Gopal P, Dekker J, Prasad J, Pillidge C, Delabre M, Collett M. 2005. Development and commercialisation of Fonterra's probiotic strains. Aust J Dairy Technol. 60: 174-183.
11. Ouwehand AC, Philipp S. 2004. *Bifidobacterium lactis* HN019; the good taste of health. Agrofood Ind Hi-Tech. 15: 10-12.
12. Schmid K, Schlothauer RC. 2003. New Probiotic Bifido Strain for Immune stimulation. Fermented milk: Proceedings of the IDF Seminar on Aroma and Texture of Fermented Milk, Kolding, Denmark, June 2002, 116-124.
13. Gill HS, Darragh AJ, Cross ML. 2001. Optimizing immunity and gut function in the elderly. J Nutr Health Aging. 5: 80-91.
14. Gill HS. 1999. Potential of using dietary lactic acid bacteria for enhancement of immunity. Dialogue 32: 6-11

News articles

1. Schwobe J, Warfsmann N. 2010. Probiotic auch für UHT-Produkte? Deutsche Milchwirtschaft 4: 117-118.

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