



HOWARU® PROTECT SENIOR

Supports immune health of Seniors

Gut microbiota and immune function evolve hand-in-hand throughout life

As people age changes in the gut microbiota composition, including loss of beneficial *bifidobacteria*, are associated with decline in immune function and may be indicative of dysbiosis and poorer health. Seniors typically experienced declined immune function, increased susceptibility to infections, decreased vaccine responses and discomfort linked to slow colonic transit time. The use of probiotics have been shown to provide health benefits to the aging adults by promoting a healthy immune system.

Helping Seniors around the globe

Seniors represent the fastest growing population globally. By 2050, the global population of seniors is projected to be nearly 2.1B. Probiotics offer a natural way for this growing population to maintain a healthy and active immune system. But not all probiotics are the same. HOWARU® Protect Senior (*Bifidobacterium lactis* HN019™) is a unique proprietary probiotic formulation designed to provide immune enhancement for aging adults.

Your daily challenge

- Supports immune health of seniors
- Follows the trend of individualized probiotic solutions
- Tailor-made products for the consumer you are targeting
- Supporting your products with clinically-documented probiotics

Proven benefits of HOWARU® Protect Senior

- A systemic review and meta-analysis of 4 clinical trials was done to determine the efficacy of probiotic *Bifidobacterium lactis* HN019™ supplementation on cellular immune activity in healthy elderly.
- The review was conducted by searching databases for clinical trials on phagocytic capacity or NK cell activity following HN019™ use in the elderly.

Phagocytosis kills harmful pathogenic bacteria helping to maintain intestinal homeostasis while NK-cell activity kills virus infected cells and restricts the spread of viral infection. In the elderly phagocytic capacity and NK cell activity are reduced.

- The random effects meta-analysis was performed with standardized mean difference (SMD) and 95% confidence interval between probiotic and control groups for each outcome.
- These four clinical studies document the effect on cellular immunity showing daily consumption of *Bifidobacterium lactis* HN019™ enhances immune function in healthy elderly adults (Arunachalam et al. 2000; Chiang et al. 2000; Gill et al. 2001a, and Gill et al. 2001b). Specifically, HN019™ improves phagocytic capacity and improves NK cell activity (Miller et al. 2017).
- In another study, *Bifidobacterium lactis* HN019™ was shown to increase the number of *bifidobacteria* in the intestine of elderly (Ahmed et al. 2007).
- Another study shows HN019™ significantly improves the colonic transit time in healthy adults helping to maintain regularity. (Waller et al. 2011). With over 70% of the immune system in the gut, the gut microbiota is important for immune health especially in the elderly.

Key findings for HN019™:

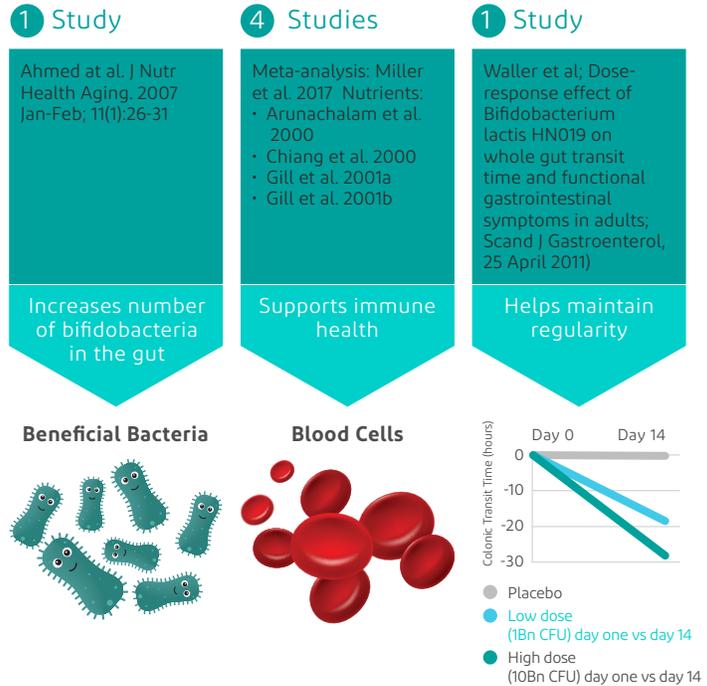
Improves immune function by:

- increasing phagocytic capacity
- improving NK-cell activity
- increasing the number of *bifidobacteria* in the intestine of elderly

Why choose HOWARU® Protect Senior?

- A clinically proven probiotic solution to support immune health in aging adults. Benefits delivered starting from 5B CFU of *Bifidobacterium lactis* HN019™
- Follows the trend of individualized probiotic solutions
- A range of convenient ready-to-market formats and concentrate available for the consumer health care, dietary supplements, and food and beverage industries, or as a custom formulation suited to your desired delivery format
- Patented probiotics for their immune health properties and shelf-stabilization technology

Unique clinical documentation – Six HN019™ studies shows relevant Senior benefits



Why choose DuPont?

- Leaders in probiotics science and innovation
- Broadest range of clinically-documented probiotics
- Unrivalled dietary supplement formulation expertise
- Global and regional applications expertise used widely by the food & beverage industries
- Robust regulatory support to help you comply with local requirements
- Marketing support and industry insights to help you successfully position your products

References

- Gill H.S., Rutherford K.J., Cross M.L., Gopal P.K. Enhancement of immunity in the elderly by dietary supplementation with the probiotic *bifidobacterium lactis* hn019™. Am J Clin Nutr 2001a, 74, 833-839.
- Gill H.S., Rutherford K.J., Cross M.L. Dietary probiotic supplementation enhances natural killer cell activity in the elderly: An investigation of age-related immunological changes. J Clin Immunol 2001b, 21, 264-271.
- Arunachalam K., Gill H.S., Chandra R.K. Enhancement of natural immune function by dietary consumption of *bifidobacterium lactis* (hn019™). Eur J Clin Nutr 2000, 54, 263-267.
- Chiang B.L., Sheih Y.H., Wang L.H., Liao C.K., Gill H.S. 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 2000, 54, 849-855.
- Ahmed M1, Prasad J, Gill H, Stevenson L, Gopal P. Impact of consumption of different levels of *Bifidobacterium lactis* HN019™ on the intestinal microflora of elderly human subjects. J Nutr Health Aging. 2007, 11(1):26-31.
- Scand J Gastroenterol. 2011 Sep;46(9):1057-64. doi: 10.3109/00365521.2011.584895. Epub 2011 Jun 13.



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