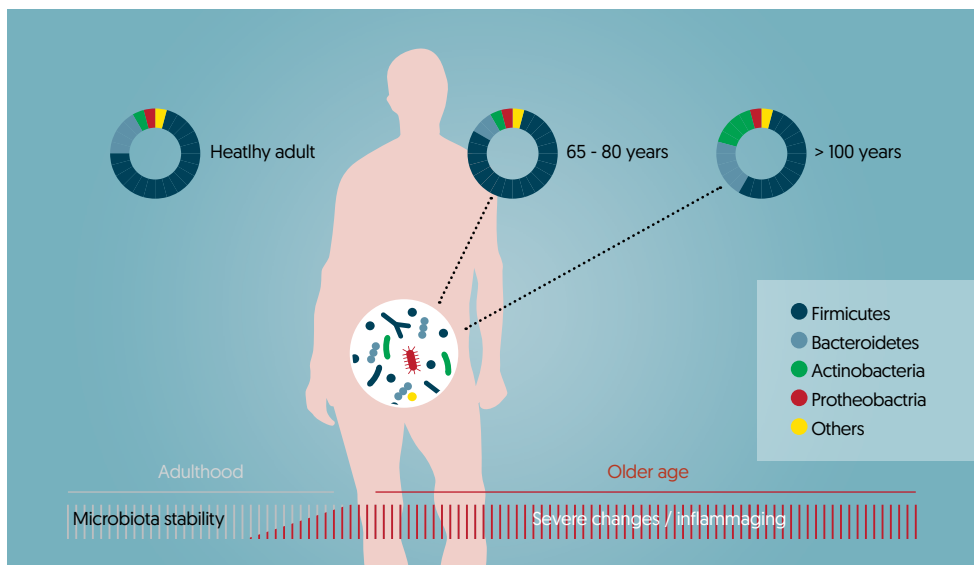


Maintaining intestinal health in elderly

Global life expectancy for men and women has increased about six years over the past two decades¹. However, ageing comes hand in hand with all sorts of infirmities of which many of them are related to age-impaired functioning of the gut microbiota.

The microbiota changes during life and an ageing microbiota is characterized by decreased diversity, reduced levels of beneficial bacteria and increased pathogenic and inflammatory species^{2,3}. Also, an ageing immune system gradually decreases in functioning, resulting in a low-grade chronic inflammatory state, also referred to as “inflammaging”⁴. Inflammaging is linked to most age-related health problems, such as; dementia, Alzheimer or atherosclerosis². This inflammatory state affects the gut microbiota and vice versa, as age-related changes in gut microbiota composition nurture an abnormally activated immune response². Moreover, the gut microbiota of elderly is affected by modifications in life-

Figure 1: Inflammaging. Source; Nikolettou V, et al. [2014] and Ottman et al. [2012].



style and nutritional behavior. Physical activity is reduced and often more than one medicine is used. Dietary choices and food digestion are changed by reductions in dentition, chewing ability and taste⁵. These alterations in composition and functioning of the intestinal microbiota are related to the progression of diseases and frailty in the el-

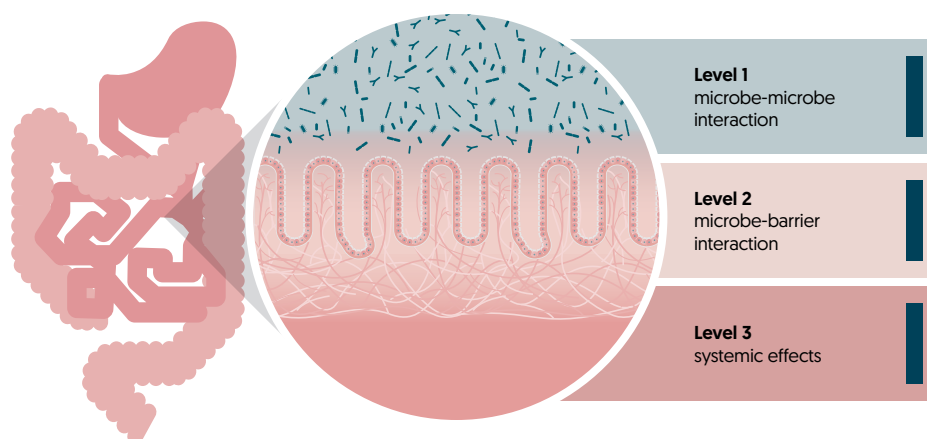
derly population. Therefore, balancing intestinal health and maintaining a healthy gut microbiota composition is essential for healthy ageing and quality of life. Manipulation of the gut microbiota of elderly by probiotics is an effective strategy to influence the development of infirmities associated with ageing.

Strain selection

Winlove Senior is a broad-spectrum, multi-species probiotic formulation developed for managing and maintaining the intestinal balance of older adults. The formulation contains 11 specifically selected probiotic strains. Probiotic strains can exert health effects at different levels in the gut [see figure 2]. The bacterial strains of Winlove Senior are active on all three levels. The strains have been screened for their capacity to:

- inhibit various pathogens such as; *E. coli*, *Salmonella*, *Shigella* and *P. agglomerans*
- improve the barrier function
- influence the immune system.

Figure 2: Probiotic strains can be active on three levels in the gut. The strains in Winlove Senior have been proven active at all three levels.



In vitro evidence

Winclove Senior contains 11 bacterial strains, among which *Propionibacterium freudenreichii* W200. This probiotic strain has the ability to produce a natural form of vitamin B12, of which elderly often have a deficiency. In addition, vitamin D3 has been added to the formulation. Vitamin D contributes, among others, to the maintenance of normal bones, teeth and muscle function. Vitamin D status is often impaired in elderly. Winclove Senior has been tested *in vitro* on:

• Inhibition of *Clostridium difficile*.

Elderly are more susceptible to *C. difficile* infections. Three bacterial strains have been added to the formulation to inhibit growth of *C. difficile*. *In vitro* testing has shown excellent capability of these strains to inhibit *C. difficile*, see figure 3.

• Strengthening the barrier function.

Ageing comes with an impaired intestinal barrier function. Three bacterial strains have been added to strengthen the intestinal barrier function. The results of *in vitro* testing with two strains in a Trans Epithelial Electrical Resistance (TEER) model are shown in figure 4. Both strains are very well capable of strengthening the intestinal barrier function. The third strain also performed well in a different model.

• Boosting the immune system.

The immune system gradually decreases in older people. Three bacterial strains have been added to the formulation to boost the immune system. These strains have shown good induction of Th1 cells, which are involved in promoting immune responses and defence. [Results not shown].

Figure 3: The inhibition of *C. difficile* and its toxins by three bacterial strains in Winclove Senior. The lower the concentration, the better the inhibition.

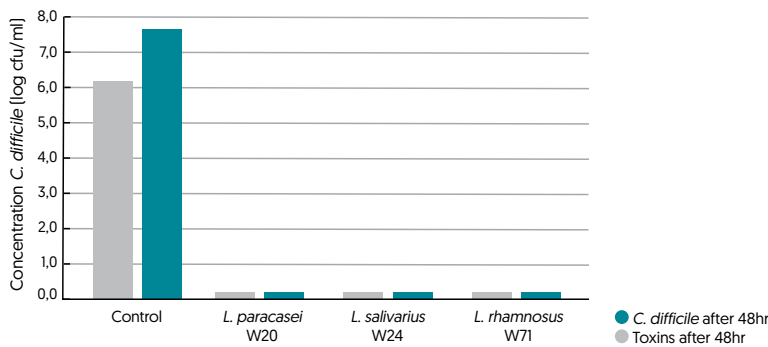
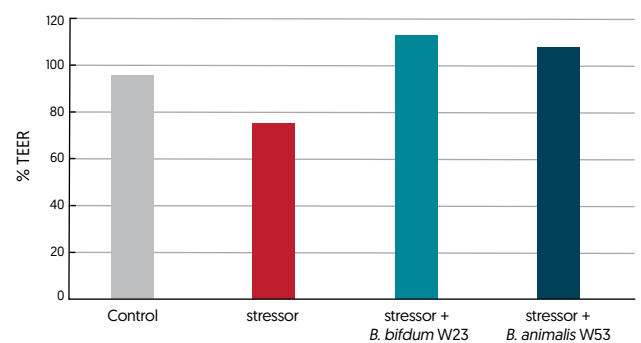





Figure 4: The capacity of two bacterial strains in Winclove Senior to strengthen the intestinal barrier function. The higher %TEER, the better the barrier function.



Formulation details

Indication	Broad-spectrum probiotic for maintaining intestinal health of elderly.			
Colony forming units (CFU)	1 x 10 ⁹ CFU/gram.			
Bacterial strains and active ingredients	<i>B. animalis</i> W53 <i>B. bifidum</i> W23 <i>B. lactis</i> W51	<i>B. lactis</i> W52 <i>L. acidophilus</i> W22 <i>L. paracasei</i> W20	<i>L. plantarum</i> W1 <i>L. rhamnosus</i> W71 <i>L. salivarius</i> W24	<i>Lc. lactis</i> W19 <i>P. freudenreichii</i> W200 and vitamin D3
PROBIOACT® Technology	 Protective and nutritional ingredients that improve the stability of the formulation, GI survival and metabolic activity of the bacteria.			
Recommended daily dosage	Variable.			
Treatment period	For as long as desired/needed.			
Storage and stability	2 years stable at room temperature, no refrigeration needed.			
Available dosage forms	Dry powder which can be supplied as bulk, sachets, capsules or fully packed (with your design).			
Safety and Quality Profile	  All probiotic strains have the Qualified Presumption of Safety (QPS) status ⁶ . Winclove is a NSF International Certified GMP Facility for manufacturing dietary supplements and is ISO 22000:2005 certified for the development and production of pre- and probiotics.			
Marketing	Private label.			
Claims	Several EU authorized claims for vitamin D3 and B12.			

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This information is intended for business professionals only, not for consumers. The formulations contained herein are concepts, not commercially available and not intended to diagnose, cure or prevent any diseases.

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