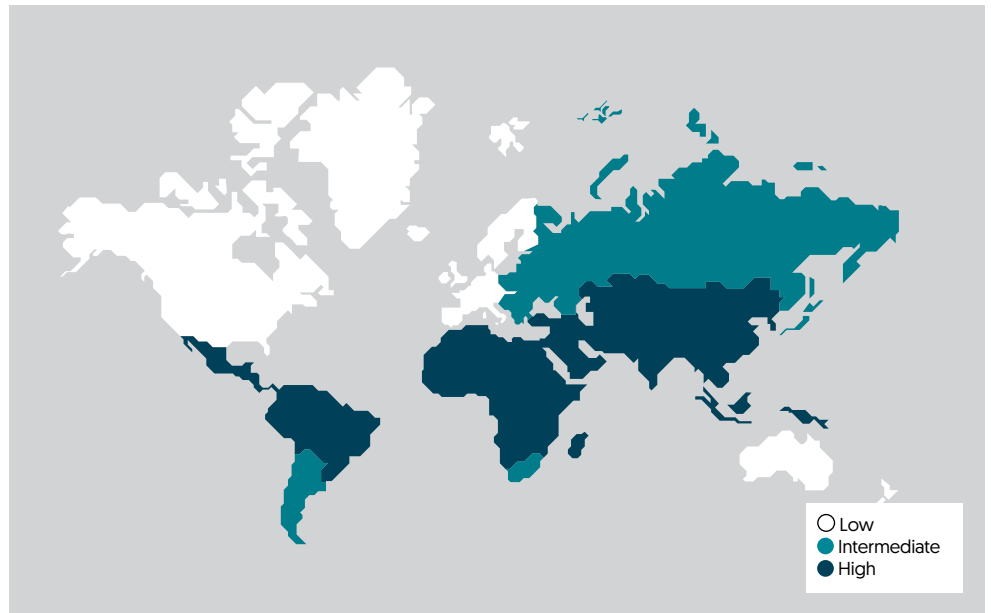


Prevention of traveller's diarrhoea

Traveller's diarrhoea (TD) is an unpleasant problem that can disrupt holidays and business trips. It usually occurs when people travel to high-risk areas -where the chance of developing TD is around 40%- such as; the Middle East, Southern and South-East Asia, South and Central America, and the developing countries in Africa^{1,2} (figure 1).

TD often starts 2-3 days after arrival and usually lasts around 2 days, although in some cases the problem may persist for 2 weeks or more. TD is often self-limiting, however, in 2-10% of the cases it may lead to persistent complaints and in 4-31% of the cases even to post-infections³. TD is most often caused by intestinal overgrowth of the pathogenic enterotoxigenic *E. coli* [ETEC]. Other bacteria known to be the possible cause of TD are

Figure 1: Worldwide risk areas of development of traveller's diarrhoea.



Campylobacter jejuni, *Shigella* species and *Salmonella* species^{4,5}. In general, TD prevention consists of the following advice: 'Boil it, peel it, cook it or forget it.' However, compliance with dietary precautionary measures is poor and it has been shown that education

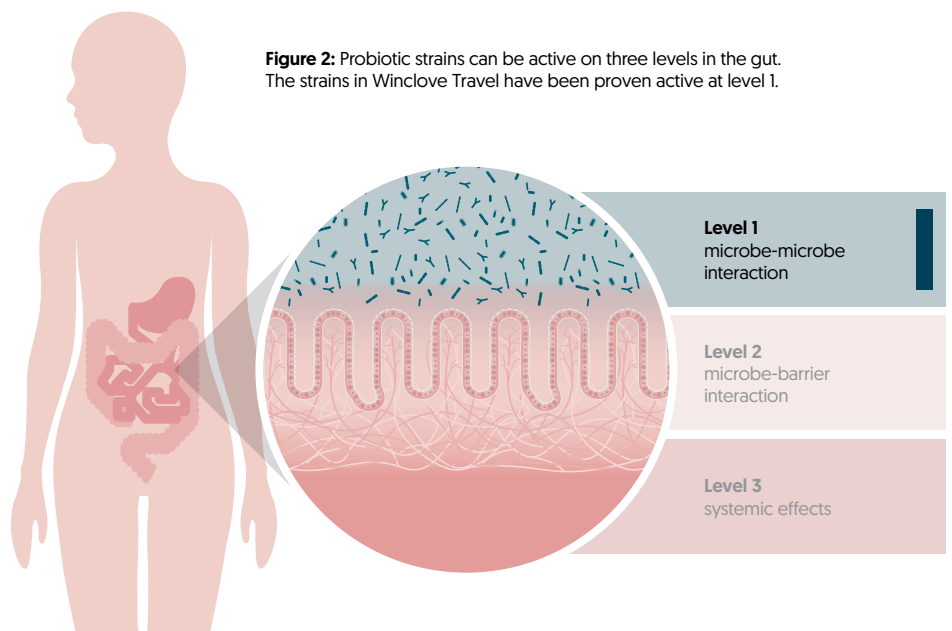
on food and liquid consumption in foreign countries does not reduce the incidence of diarrhoea⁶. Probiotics have shown protective effects against pathogens and could therefore represent a potential alternative in the prevention of TD⁷⁻¹⁰.

Strain selection

Winlove Travel is a multispecies probiotic formulation, developed to reduce the risk of developing TD. The formulation consists of 8 specifically selected probiotic strains. Probiotic strains can exert health effects at different levels in the gut [see figure 2]. The bacterial strains of Winlove Travel have been selected for their capacity to protect against pathogens known to cause TD, such as: *E.coli*, *Shigella* and *Salmonella*, through;

- producing antimicrobial agents
- inhibiting pathogen adhesion
- competing with pathogens for nutrients.

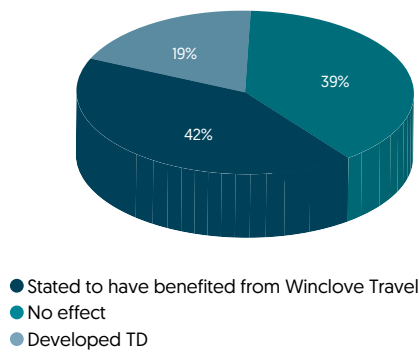
Figure 2: Probiotic strains can be active on three levels in the gut. The strains in Winlove Travel have been proven active at level 1.



Clinical and *in vitro* evidence

Winlove Travel has been tested in a pilot study with 200 travellers travelling to high-risk areas. The travellers took 5 grams of Winlove Travel once daily, starting a couple of days before their trip. All travellers filled out a diary during their trip, scoring their defecation pattern according to the Bristol stool scale. Results show that Winlove Travel is able to reduce the risk of TD. Only 19% developed TD, which is normally 40%. Of the participants 42% stated to have benefited from the formulation (figure 3).

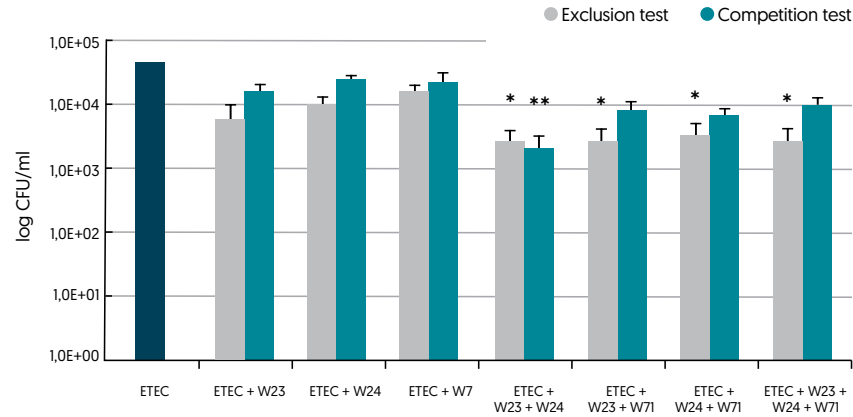
Figure 3: Clinical evidence of 200 travellers taking Winlove Travel.



The effect of individual, as well as combinations of Winlove Travel strains on five intestinal pathogens [*S. enteritidis*, *L. monocytogenes*, *E. coli* O157:H7 (ETEC), *C. sakazakii*, *C. jejuni*] has been tested *in vitro*¹¹. All the strains showed antagonistic effects against the pathogens through different inhibitory mechanisms, including; antimicrobial activity, interference of adhesion of the pathogens to the intestinal wall, and growth competition/exclusion. Combinations of strains showed greater effect than single strains. As can be

seen in figure 4, single strains reduced the invasion ability of *E. coli*, however, strain combinations induced an even more remarkable effect. These results confirm the importance of multispecies formulations to potentiate beneficial effects and indicate that supplementation with Winlove Travel could prevent TD.

Figure 4: Invasion inhibition of ETEC by single and combinations of Winlove Travel strains measured in an exclusion and competition test. A decrease in CFUs (expressed on a log scale) indicates inhibition. * Significant effect [$P < 0.05$].



Formulation details

Indication	Prevention of traveller's diarrhoea.			
Colony forming units [CFU]	1 x 10 ⁹ CFU/gram.			
Bacterial strains	<i>B. bifidum</i> W23 <i>B. lactis</i> W51	<i>L. acidophilus</i> W37 <i>L. casei</i> W56	<i>L. plantarum</i> W21 <i>L. rhamnosus</i> W71	<i>L. salivarius</i> W24 <i>L. lactis</i> W58
PROBIOACT® Technology	Protective and nutritional ingredients that improve the stability of the formulation, GI survival and metabolic activity of the bacteria.			
Recommended daily dosage	5 grams.			
Treatment period	Start a couple of days before travel until end of the journey.			
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 ¹² . Winlove 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.			

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- Campana R. et al. Strain-specific probiotic properties of lactic acid bacteria and their interference with humanintestinal pathogens invasion. Gut Pathog. 2017;9(12).

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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