



Brain health

The Science of Sleep: New Study Shows Biotis™ SleepWell Can Contribute to a Better Night's Sleep



Summary of Study Results

Sleep deprivation is a prevalent issue - market research suggests that as many as 30% of consumers worldwide suffer from regular sleep disturbance! The effects of this can be significant. Poor sleep has been linked to a lack of energy, impaired attention span and memory recall,² as well as more long-term issues such as stress, anxiety, depression, obesity, diabetes, a weakened immune system and even a lower life expectancy.³

With the global sleeping aids market estimated to reach a value of \$162.5 billion by 2030,⁴ FrieslandCampina Ingredients is continuing to invest in the development of scientifically proven ingredients to help companies deliver on the promise of a better night's sleep. The good news? A recent study has shown that our Biotis™ SleepWell can reduce stress, stimulates intestinal *Bifidobacteria*, and supports adults with moderate sleep disturbances in improving perceived sleep quality. Want to know more? We've summarised the key findings below!

But first, what is Biotis™ SleepWell?

Biotis™ SleepWell is a product designed by FrieslandCampina Ingredients to inspire manufacturers and demonstrate what's possible when developing convenient and natural solutions to help improve consumers' sleep quality. Launched as part of our Biotis™ brand, which marks a new era in ingredient science, it's the flagship product solution in our Brain Health benefit area.

Biotis™ SleepWell is made from a unique combination of well-researched ingredients that can be formulated as a beverage, shot or powder, leveraging the gut-brain axis to support better sleep.

These ingredients are:

- **Biotis™ GOS (galacto-oligosaccharides)**
a dairy-derived prebiotic ingredient that has been shown to influence the balance of the human microbiome, resulting in beneficial effects on physical and mental health.
- **Whey protein**
a source of tryptophan, an amino acid that is necessary for the production of serotonin and melatonin to help people to relax and fall asleep naturally.
- **Magnesium and vitamin D**
necessary in the synthesis and function of neurotransmitters.
- **A tryptic digest of casein**
containing a bioactive peptide that has shown to reduce stress and is indicated to improve sleep quality.

So what did the study aim to find out?

The study was conducted by FrieslandCampina Ingredients and NIZO. Its aim was to investigate the effects of Biotis™ SleepWell on sleep quality, stress, and the gut microbiota in adults with moderate sleep disturbances.

Who took part in the study?

70 healthy men and women aged between 30 and 50 years of age were included in the study. Each subject was classified as having moderate sleep problems, reporting a Pittsburgh Sleep Quality Index (PSQI) score of ≥ 9 . Subjects with diagnosed sleep problems, using medicines known to cause sleep issues, working in shifts, having respiratory problems causing poor sleep, or having a medical history affecting the intestine and/or digestion were excluded from participation.



This information is intended for industrial customers only and not intended for consumers.

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And what methods did the study use?

The study was designed as a double-blind randomised placebo-controlled cross-over study. Study products (Biotis™ SleepWell or semi-skimmed milk powder) were taken daily for 3 weeks, one hour before bed. The washout period between treatments was three weeks.

During the study, the following methods were used to measure the impact of Biotis™ SleepWell on sleep quality and stress:

- Lifestyle habits and sleep characteristics were assessed by a daily online questionnaire.
- Sleep quality was tracked using a weekly online questionnaire called the Pittsburgh Sleep Quality Index (PSQI). This validated questionnaire contained 19 self-rated and 5 bed partner/roommate (if applicable) rated questions.
- Mood and stress levels were measured using the Depression Anxiety and Stress Scale (DASS-42) questionnaire at the beginning and end of each study period.
- Levels of cortisol, a stress-related hormone, were measured in morning saliva samples at the beginning and end of each study period.
- Sleep patterns were measured during the night using a head-band sleep tracker (Philips, Eindhoven).
- Microbiota analysis was conducted using stool samples from the participants at the beginning and end of the first intervention period.

What were the results⁵ of the study?

Sleep quality improved after 14 days in those with a PSQI score at baseline of ≥ 9 , as measured by the PSQI questionnaire. Although no significant changes took place in self-reported mood according to the DASS-42 questionnaire, after 21 days, participants who had taken Biotis™ SleepWell had reduced early morning cortisol levels compared to the group taking the placebo. This indicates the potential for stress reduction in the case of Biotis™ SleepWell.

Finally, the microbiota analysis showed that participants taking Biotis™ SleepWell had improved gut health, characterised by enhanced *Bifidobacteria* levels. The outcomes also indicate that low abundance of *Bifidobacteria* levels at baseline are associated with an increased chance of improving sleep quality.

So what do these findings mean for the nutrition and supplements industry?

Consumers are increasingly seeking natural, non-pharmaceutical solutions to boost mental well-being and improve sleep. This study is another milestone in demonstrating how foods, drinks and supplements can do this, and how the gut-brain axis may be important to provide tangible benefits in sleep and mood.

The gut-brain axis is an expanding area of research, and FrieslandCampina Ingredients is always collaborating with the scientific community to explore the uses of ingredients derived from dairy to tackle global health issues – so keep an eye out for further research into this area from us!

You can [read the full study here](#) or find out more about Biotis™ Brain Health Benefit Solutions range at www.biotis.com/brain-health

References

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