




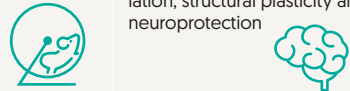




# Overview of scientific studies with Ecologic<sup>®</sup> BARRIER














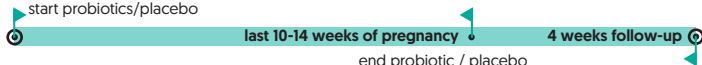
















Depression is a global burden, affecting the quality of life of millions of people worldwide. The gut barrier plays an essential role in the communication between the gut and the rest of the body, including between the gut and brain via the gut-brain axis. Ecologic<sup>®</sup> Barrier is a multispecies probiotic formulation specifically designed to strengthen and optimize the intestinal barrier function and decrease low-grade inflammation, both of which play an important role in depression and cognition.

Several preclinical and clinical studies have shown that Ecologic<sup>®</sup> Barrier is a promising adjunctive therapy in the management of depressive symptoms, as well as improving brain function under stress. The tables below summarize the preclinical and clinical studies performed with Ecologic<sup>®</sup> Barrier.

## Preclinical animal studies with Ecologic<sup>®</sup> Barrier Mood & Depression

Study	Design	Method	Product	Result
<p>The antidepressant-like effect of probiotics and their faecal abundance may be modulated by the cohabiting gut microbiota in rats</p> <p><b>Abidgaard, A., et al, 2019</b></p>	<p><b>Post hoc analysis</b></p> 	<p><b>2x20</b> Sprague-Dawley rats (responders and non-responders)</p> <p>start diet            Conventional 5 weeks            start probiotic / placebo            8 weeks            end probiotic / placebo</p>	<p>~5.6 x 10<sup>9</sup> CFU Ecologic<sup>®</sup> BARRIER</p>	<p><b>Increased Shannon diversity</b> only in the animals responding to the probiotic treatment (i.e. responders). Effects of Ecologic<sup>®</sup> Barrier are dependent on the composition of the gut microbiota</p> 
<p>Probiotics reduce risk-taking behavior in the Elevated Plus Maze in the Flinders Sensitive Line rat model of depression.</p> <p><b>Tillmann, S., et al, 2019</b></p>	<p><b>RCT</b></p> 	<p><b>24</b> Flinders Sensitive Line rats</p> <p>start probiotic / placebo            Probiotic (n=8) 9 weeks            Probiotic + 4 additional strains (n=8)            Placebo (n=8)            end probiotic / placebo</p>	<p>5 x 10<sup>9</sup> CFU Ecologic<sup>®</sup> BARRIER</p>	<p><b>Significant reduction in risk-taking behavior in the probiotic group.</b> Addition of four bacterial strains to Ecologic<sup>®</sup> Barrier did not potentiate its effect</p> 
<p>Probiotic treatment reduces depressive-like behaviour in rats independently of diet.</p> <p><b>Abidgaard, A., et al, 2017</b></p>	<p><b>RCT</b></p> 	<p><b>40</b> Sprague-Dawley rats</p> <p>start diet            Conventional 5 weeks            High fat            start probiotic / placebo            5 weeks            end probiotic / placebo</p>	<p>~5.6 x 10<sup>9</sup> CFU Ecologic<sup>®</sup> BARRIER</p>	<p><b>Reduced depressive-like behavior</b> in the probiotic group independent of diet</p> <p><b>Probiotics positively influence</b> hippocampal HPA axis regulation, structural plasticity and neuroprotection</p> 
<p>Probiotic treatment protects against the pro-depressant-like effect of high-fat diet in Flinders Sensitive Line rats.</p> <p><b>Abidgaard, A., et al, 2017</b></p>	<p><b>RCT</b></p> 	<p><b>46</b> Flinders Sensitive Line rats</p> <p>start diet            Conventional 5 weeks            High fat            start probiotic / placebo            5 weeks            end probiotic / placebo</p>	<p>~5.6 x 10<sup>9</sup> CFU Ecologic<sup>®</sup> BARRIER</p>	<p><b>Probiotics protect against depressive-like behaviour</b> caused by high-fat diet</p> 

## Clinical studies with Ecologic Barrier Mood & Depression

Study	Design	Method	Product	Result
<p>The effects of probiotics on risk and time preferences</p> <p><b>Dantas, AM, et al., 2022</b></p>	<p><b>RCT</b></p> 	<p> <b>75</b> healthy volunteers</p> <p>▶ start probiotic / placebo</p>  <p>end probiotic / placebo</p>	<p>1x 2 gram (5x10<sup>10</sup> CFU) <b>Ecologic® BARRIER</b></p>	<p><b>Significant reduction in risk-taking behaviour</b> in the probiotic group</p>  <p><b>Significant increase in future-oriented choices</b> in the probiotic group</p> 
<p>Psychobiotics for patients with chronic gastrointestinal disorders having anxiety or depression symptoms</p> <p><b>Dao, VH, et al., 2021</b></p>	<p><b>Open label</b></p> 	<p> <b>111</b> patients with anxiety/depression and chronic GI symptoms</p> <p>▶ start probiotic</p>  <p>end probiotic</p>	<p>1x 2 gram (5x10<sup>10</sup> CFU) <b>Ecologic® BARRIER</b></p>	<p><b>Significant improvement in anxiety and depression symptoms</b></p>  <p><b>Significant decrease in GI complaints</b></p>  <p><b>Significant increase in QoL</b></p> 
<p>Probiotics as a treatment for prenatal maternal anxiety and depression: a double blind randomized pilot trial</p> <p><b>Browne, PD, et al., 2021</b></p>	<p><b>RCT</b></p> 	<p> <b>40</b> healthy pregnant women with elevated depressive symptoms and/or anxiety</p> <p>▶ start probiotics/placebo</p>  <p>end probiotic / placebo</p>	<p>1x 2 gram (5x10<sup>10</sup> CFU) <b>Ecologic® BARRIER</b></p>	<p>Probiotic use <b>during pregnancy is well tolerated</b></p>  <p><b>No significant differences</b> in depressive symptoms and anxiety between probiotic and placebo group</p>
<p>Probiotics-induced changes in gut microbial composition and its effects on cognitive performance after stress: exploratory analyses</p> <p><b>Bloemendaal, M., et al, 2021</b></p>	<p><b>RCT</b></p> 	<p> <b>61</b> healthy female volunteers</p> <p>▶ start probiotic / placebo</p>  <p>end probiotic / placebo</p>	<p>1x 2 gram (1x10<sup>10</sup> CFU) <b>Ecologic® BARRIER</b></p>	<p><b>Increased relative abundance of eight gut microbiota genera</b></p> <p>Probiotic-induced increase in genus Ruminococcaceae_UCG-003 is significantly associated with Ecologic® Barrier protective effect on working memory performance during acute stress</p> 
<p>Stress matters: Randomized controlled trial on the effect of probiotics on neurocognition</p> <p><b>Papalini, S, et al., 2019</b></p>	<p><b>RCT</b></p> 	<p> <b>61</b> healthy female volunteers</p> <p>▶ start probiotic / placebo</p>  <p>end probiotic / placebo</p>	<p>1x 2 gram (5x10<sup>10</sup> CFU) <b>Ecologic® BARRIER</b></p>	<p><b>Probiotic intake significantly protect working memory performance during acute stress</b></p> 
<p>Gut feelings: A randomised, triple-blind, placebo-controlled trial of probiotics for depressive symptoms</p> <p><b>Chahwan, B., et al, 2019</b></p>	<p><b>RCT</b></p> 	<p> <b>71</b> patients with major depressive disorder (MDD)</p> <p>▶ start probiotic / placebo</p>  <p>end probiotic / placebo</p>	<p>2x 2 gram (1x10<sup>10</sup> CFU) <b>Ecologic® BARRIER</b></p>	<p><b>Significant reduction of cognitive reactivity to sad mood</b> in mildly to moderately depressed patients</p> 
<p>A randomized controlled trial to test the effect of multispecies probiotics on cognitive reactivity to sad mood</p> <p><b>Steenbergen, L., et al, 2015</b></p>	<p><b>RCT</b></p> 	<p> <b>40</b> healthy students</p> <p>▶ start probiotic / placebo</p>  <p>end probiotic / placebo</p>	<p>1x 2 gram (1x10<sup>10</sup> CFU) <b>Ecologic® BARRIER</b></p>	<p><b>Significant reduction of overall cognitive reactivity</b> to sad mood, largely accounted for by reduced rumination [-30%] and aggressive thoughts [-26%]</p> 