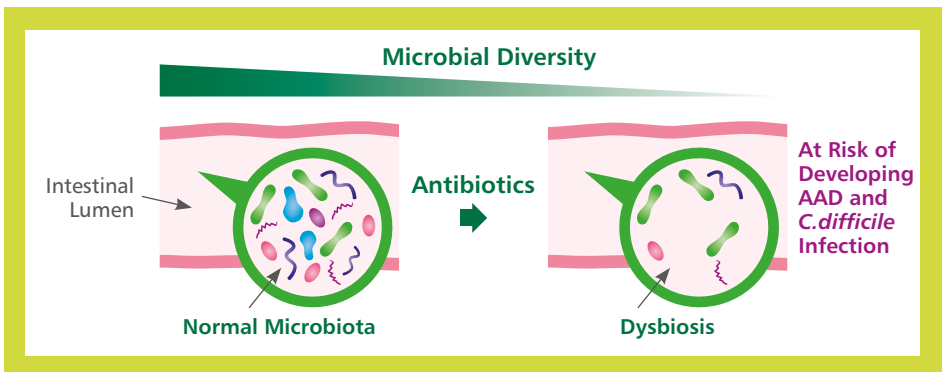


# Prevention of Antibiotic-Associated Diarrhoea and *Clostridium difficile* in adults and children

Evidence series

- When a patient takes antibiotics, these will also kill part of their normal microbiota, resulting in a microbial imbalance or dysbiosis.<sup>1</sup> (Figure 1)
- Antibiotic-associated diarrhoea (AAD) is the most common gastrointestinal complication following antibiotic use, especially for broad-spectrum antibiotics.<sup>2</sup>
- Its rate of occurrence varies between 5-39%, depending on the patient population and the type of antibiotic given.<sup>3</sup>
- AAD can range in severity from mild diarrhoea to life-threatening pseudomembranous colitis.<sup>4</sup>
- *Clostridium difficile* (*C. difficile*) can be the cause in 15-39% of the AAD cases of hospitalised elderly patients.<sup>5</sup>
- After a first infection with *C. difficile*, its rate of recurrence ranges from 8-50%<sup>6,7</sup> with a risk of mortality of nearly 7%.<sup>8,9</sup>
- **Probiotics can reduce the risk of developing AAD by 42%, and by 64% in the case of *C. difficile* associated diarrhoea in adults.**<sup>10,11</sup>
- **In children, probiotics can reduce the risk of AAD by 54%.**<sup>12</sup>

**Figure 1** Antibiotic-induced gut dysbiosis.

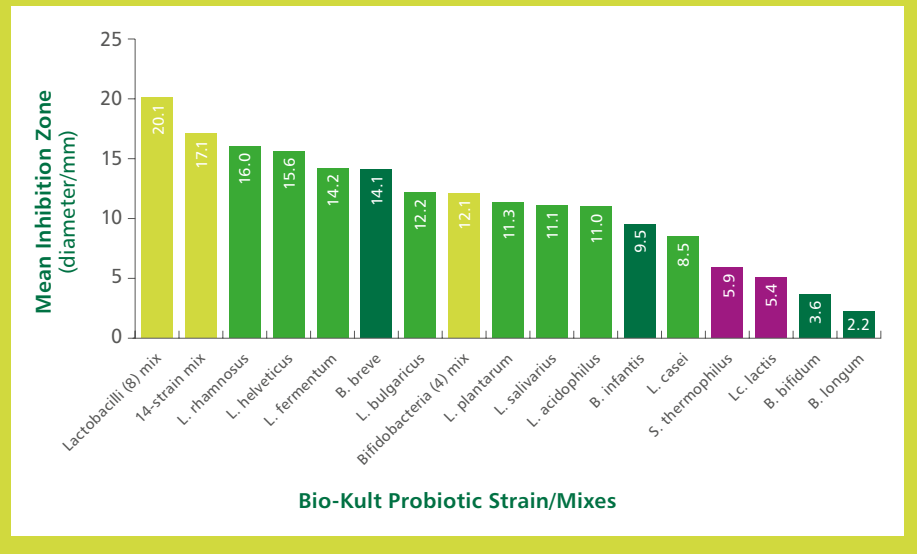


# The evidence behind Bio-Kult probiotics

- Bio-Kult's probiotic strains have the capacity to inhibit the growth of *C. difficile*.<sup>13</sup> (Figure 2)
- Several studies demonstrate that multi-strain probiotic preparations are more likely to be effective in counteracting the growth of pathogens when compare with single strains.<sup>13-16</sup>
- Bio-Kult's *Bacillus subtilis* strain (PXN21) has the capacity to attenuate the effects of *C. difficile* infection and increases the survival experimentally infected mice.<sup>17</sup> (Figure 3)
- In a double blind, randomised, placebo controlled clinical trial Bio-Kult strains has demonstrated a statistically significant reduction of AAD.<sup>18</sup> (Figure 4)
- Clinical and basic research demonstrate that administration of antibiotics together with Bio-Kult strains represent an opportunity for the healthcare sector to reduce the burden of AAD and *C. difficile* infection.

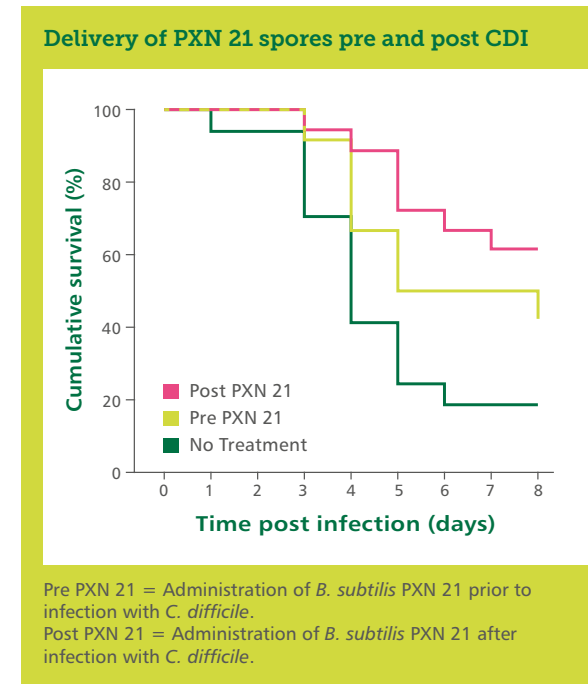
**Figure 1 Bio-Kult probiotics strains inhibit the proliferation of *C. difficile*.**

## Inhibition of *C. difficile* by Bio-Kult probiotic strains and mixtures

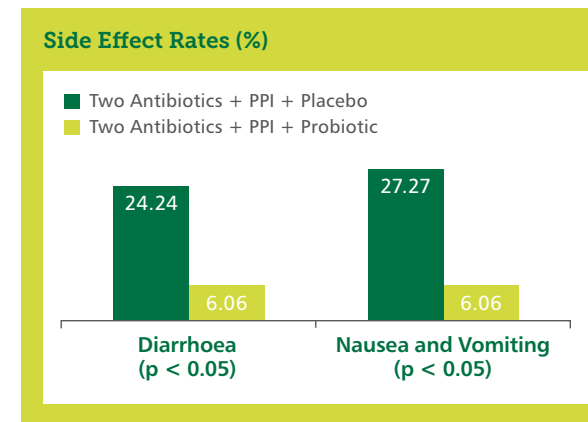


(Chapman et al, 2012)

**Figure 3 Bio-Kult's *Bacillus subtilis* strain (PXN21) has the capacity to attenuate the effects of *C. difficile* infection (CDI) and increases the survival experimentally infected mice.**


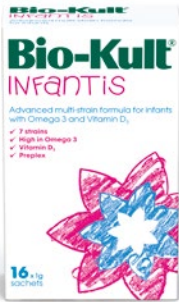


**Figure 4 Bio-Kult strains have also demonstrated, in the context of a randomised controlled clinical trial, to effectively reduce the risk of developing AAD and other antibiotic associated side effects.**



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<b>LIVE BACTERIAL CULTURES</b>	<p><i>Bacillus subtilis</i> PXN 21  <i>Bifidobacterium bifidum</i> PXN 23  <i>Bifidobacterium breve</i> PXN 25  <i>Bifidobacterium infantis</i> PXN 27  <i>Bifidobacterium longum</i> PXN 30  <i>Lactobacillus acidophilus</i> PXN 35  <i>Lactobacillus delbrueckii</i> ssp. <i>bulgaricus</i> PXN 39  <i>Lactobacillus casei</i> PXN 37  <i>Lactobacillus plantarum</i> PXN 47  <i>Lactobacillus rhamnosus</i> PXN 54  <i>Lactobacillus helveticus</i> PXN 45  <i>Lactobacillus salivarius</i> PXN 57  <i>Lactococcus lactis</i> ssp. <i>lactis</i> PXN 63  <i>Streptococcus thermophilus</i> PXN 66</p>	<p><i>Lactobacillus casei</i> PXN 37  <i>Lactobacillus rhamnosus</i> PXN 54  <i>Streptococcus thermophilus</i> PXN 66  <i>Lactobacillus acidophilus</i> PXN 35  <i>Bifidobacterium breve</i> PXN 25  <i>Lactobacillus delbrueckii</i> ssp. <i>bulgaricus</i> PXN 39  <i>Bifidobacterium infantis</i> PXN 27</p>
<b>OTHER INGREDIENTS</b>	<p>Cellulose (bulking agent)</p>	<p>DHA + EPA Powder: &gt;1mg per sachet (Omega-3 fatty acid from fish)  Vitamin D<sub>3</sub>: 2.5mcg per sachet (50% of Nutrient Reference Value)  Preplex® (fructooligosaccharide (FOS) and gum acacia)</p>
<b>TOTAL VIABLE COUNTS (CFU)</b>	<p>2 x 10<sup>9</sup> CFU/capsule</p>	<p>1 x 10<sup>9</sup> CFU/sachet</p>
<b>USAGE GUIDELINES</b>	<p>Take 4 capsules per day (2 capsules twice a day) during the antibiotic treatment and for at least 2 weeks after completion of the antibiotic course. Children under 12 y.o. half adult dose</p>	<p>½ -1 sachet once a day mixed with milk, water or food (start with ¼ of a sachet for babies &lt;6 months) during the antibiotic treatment and for at least 2 weeks after completion of the antibiotic course</p>

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