

**Supplemental File 1:** Tolerance data of fibers with limited gastrointestinal side-effects chosen for the fiber intervention trial

| Reference               | Population<br>Age, years (y)<br>(mean $\pm$ standard deviation)                       | Type of fiber                                                                                                 | Dose                                                                                        | Tolerance outcomes<br>Summary                                                                                                                                                                                                                                 |
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| Calame et al., (2011)   | Adults;<br><br>Study I: $36.8 \pm 16.9$<br>Study II: $36.6 \pm 12.7$                  | Acacia Gum                                                                                                    | 5, 10, or 40 g/d                                                                            | No reported GI discomfort                                                                                                                                                                                                                                     |
| Babiker et al., (2018)  | Adults;<br>$50.09 \pm 9.3$                                                            | Acacia Gum                                                                                                    | 30 g/d                                                                                      | Minor side effects during the first week of the intervention (viscous sensation (32%), diarrhea (11%), nausea (8%), and abdominal bloating (6%). Symptoms subsided within the second week of intake, with only the discomfort of viscous sensation continuing |
| Babiker et al., (2012)  | Adults;<br>Study group:<br>$19.37 \pm 1.97$<br><br>Control group:<br>$19.53 \pm 2.25$ | Acacia Gum                                                                                                    | 30 g/d                                                                                      | Side effects were mild, experienced only in the first week and then resolved. They included unfavorable viscous sensation in the mouth (100%), early morning nausea (81.7%), mild diarrhea (90%) and bloating abdomen (15%).                                  |
| Cherbut et al., (2003)  | Adults;<br>Study I: 22-33 y<br>Study II: 22-38 y                                      | Acacia Gum                                                                                                    | 10-70 g/d                                                                                   | No difference in tolerance $\leq 30$ g/d. Above this dose, the main complaint was excessive flatulence. However, the mean degree of severity remained mild ( $<1$ ), even at doses $>50$ g/d. Other intestinal events were rarely reported.                   |
| Weber et al., (2014)    | Children;<br>Fiber group: $8.5 \pm 1.8$<br><br>Control group:<br>$7.7 \pm 2.4$        | 10.5% Oligofructose, 12.5% Inulin, 24% Acacia Gum, 9% Resistant Starch, 33% Soy Polysaccharide, 12% Cellulose | 3.8 and 7.6 g/d (based on participant weight; 3.8 g/d when $<18$ kg, 7.6 g/d when $>18$ kg) | Adverse events were not observed for either group, and the products were well tolerated.                                                                                                                                                                      |
| Pedersen et al., (2013) | Adults;<br>$25.0 \pm 1.2$                                                             | Oligofructose                                                                                                 | 15, 25, 35, 45, and 55 g/d                                                                  | All doses were well tolerated with no apparent dose–response effect on GI symptom or general wellbeing scores.                                                                                                                                                |
| Holscher et al., (2014) | Adults;<br>$27.1 \pm 4.1$                                                             | Oligofructose                                                                                                 | 5 and 7.5 g/d                                                                               | $\leq 7.5$ g/day led to minimal GI upset, with no change in diarrhea, and improved laxation                                                                                                                                                                   |

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| Liber et al., (2014)     | Children;<br>12. 3 ± 2.9                                                                                                       | Oligofructose                                     | 8 g/d for children<br>7–11 y<br>15 g/d for children<br>12–18 y                                                     | Adverse effects measured including abdominal pain, flatulence, diarrhoea/loose stool, borborygmi, nausea, and heartburn, did not differ statistically from placebo.                                                                                                                                                                                                                                 |
| Nicolucci et al., (2017) | Children;<br><br>Prebiotics group:<br>10.4 ± 0.3<br><br>Placebo group:<br>10.2 ± 0.4                                           | Oligofructose -<br>enriched inulin                | 8 g/d                                                                                                              | No gastrointestinal side effects were experienced by 70% of the prebiotic group and 61% of the placebo. A mild ↑ in flatulence and bloating was experienced by 25% and 28% of subjects in prebiotic and placebo, respectively. A moderate ↑ in flatulence and bloating was reported by 5% and 11% of subjects in prebiotic and placebo, respectively. No reports of severe effects in either group. |
| Pasman et al., (2006)    | Adults;<br>Glucidex® group:<br>33.8±10.1<br><br>30g Nutriose® FB<br>group: 35.7±7.6<br><br>45g Nutriose® FB<br>group: 34.4±7.4 | Resistant<br>Maltodextrin                         | 30 or 45 g/d                                                                                                       | Both doses were very well tolerated and GI complaints did not differ greatly from the placebo treatment. Some habituation and adaptation of the GI symptoms occurred                                                                                                                                                                                                                                |
| Ye et al., (2015)        | Adults;<br>36 ± 16                                                                                                             | Resistant<br>Maltodextrin                         | 5 or 10 g/d                                                                                                        | No reported GI discomfort                                                                                                                                                                                                                                                                                                                                                                           |
| van den Heuvel (2004)    | Adults;<br>31.7 ± 9.1                                                                                                          | Resistant<br>Maltodextrin                         | 10, 30, and 60<br>g/day OR<br>10, 15, 45, and 80<br>g/d                                                            | Well tolerated up to a dose of 45 g daily. Higher daily dosages (60 and 80 g) may result in flatulence, but did not result in diarrhea.                                                                                                                                                                                                                                                             |
| Fastinger et al., (2008) | Adults;<br>Group I: 26.6 ± 4.5<br>Group II: 28.2 ± 6.1<br>Group III: 26.7 ± 4.2                                                | Resistant<br>Maltodextrin                         | 15 g/d                                                                                                             | Very minor effects in gastrointestinal tolerance                                                                                                                                                                                                                                                                                                                                                    |
| Vuksan et al., (2009)    | Children;<br>16.1 ± 0.6                                                                                                        | PolyGlycopleX<br>(PGX)                            | 5g                                                                                                                 | No differences in gastrointestinal tolerance between groups                                                                                                                                                                                                                                                                                                                                         |
| Carabin et al., (2009)   | Adults;<br>31.6 ± 10.5                                                                                                         | PolyGlycopleX<br>(PGX)                            | 2.5-10 g/d                                                                                                         | Well tolerated with only mild to moderate adverse gastrointestinal effects that did not differ from those seen in the control groups.                                                                                                                                                                                                                                                               |
| Ho et al., (2016)        | Children aged 8 to 17 y                                                                                                        | Maltodextrin<br>Oligofructose-<br>enriched inulin | Placebo group:<br>(maltodextrin 3.3<br>g/day<br><br>Prebiotic group:<br>oligofructose-<br>enriched inulin 8<br>g/d | Authors anticipate a change in gut microbiota, gut permeability and inflammatory markers over the course of several weeks of prebiotic supplementation. No GI issues anticipated                                                                                                                                                                                                                    |
| Drabińska., et al (2018) | Children                                                                                                                       | Maltodextrin                                      | Prebiotic group:<br>oligofructose-                                                                                 | No reported GI discomfort                                                                                                                                                                                                                                                                                                                                                                           |

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|                                                            | Synergy group: 10 (range: 5–17)<br>Placebo group: 10 (range: 4–16)                                                          | Oligofructose-enriched inulin                              | enriched inulin 10 g/day<br>Placebo group: maltodextrin.                                                                    |                                                                                                                                                                                                                               |
| Abrams et al., (2007)                                      | Children aged 9 to 13 y of age                                                                                              | Inulin-type fructans (ITF)<br><br>Maltodextrin             | Prebiotic group: 1:1 of oligofructose and long-chain inulin 8g/d<br><br>Control: maltodextrin 8 g/day                       | No reported GI discomfort                                                                                                                                                                                                     |
| Cani et al., (2005)                                        | Adults aged 21–39 y of age                                                                                                  | Oligofructose<br><br>Maltodextrine                         | 8 g each/ twice daily (16 g/d in total).                                                                                    | Compliance was excellent; minor gastrointestinal disorders (abdominal rumbling, flatulence) were reported only on the first 3 days of oligofructose treatment.                                                                |
| Waligora-Dupriet et al., (2017)                            | Oligofructose (OF) group: 14.2 ± 3.5 months of age<br><br>Maltodextrin group: 12.6 ± 3.4 months of age                      | Oligofructose<br><br>Maltodextrin                          | Oligofructose group: 2 g/d<br><br>Control: 2 g/d of maltodextrin<br><br>In one single daily administration.                 | No intolerance phenomenon induced any exclusion from the protocol. There were no adverse events. The number of episodes of flatulence and diarrhea were significantly lower in the OF group as compared to the control group. |
| Moore et al., (2003)                                       | Infants aged 4–12 months of age                                                                                             | Oligofructose (OF)<br><br>Maltodextrin                     | OF group: Combination of cereal with 0.03 g OF/g cereal<br><br>Control: combination of cereal with 0.03 g maltodextrin      | Increase in intestinal gas and discomfort                                                                                                                                                                                     |
| Kranz et al., (2012)                                       | Summary of existing evidence on implications of dietary fiber on constipation, obesity, and diabetes in children.           |                                                            |                                                                                                                             | Fiber contributes to the maintenance of a healthy gastro-intestinal function and prevents and treats childhood constipation.                                                                                                  |
| Curtin University, Australia (2019)                        | Aim: examine the effect of PolyGlycopleX® (PGX®) supplementation on metabolic risk factors in overweight and obese children | PGX                                                        | Seventy overweight and obese children will consume 10 g PGX® or placebo supplement (as a divided dose of 5 g) for 16 weeks. | Ongoing study                                                                                                                                                                                                                 |
| <b>Adaptation to improved tolerance of fiber over time</b> |                                                                                                                             |                                                            |                                                                                                                             |                                                                                                                                                                                                                               |
| Grabitske et al., (2009)                                   | Review of published studies reporting GI effects of Low-digestible carbohydrates (LDCs)                                     | Sixty-eight studies and six review articles were evaluated |                                                                                                                             | Daily intakes of 8–10 g sorbitol and xylitol and 25 g isomalt or polyglycitol may contribute to a mild laxative effect yet may be acceptable                                                                                  |

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|                                |                                                                                                         |                                                                                                                   |                                                                                          | for school-age children and adolescents.<br><u>More clinical studies of LDCs should be conducted with children to assess the effects of their incorporated into beverages and various foods consumed with meals.</u>                                       |
| Makki et al., (2018)           | Review focused on dietary fibers and their impact on gut microbial ecology, host physiology, and health | Slower fermenting polysaccharides, such as resistant starch, arabinoxylan, acacia gum, and resistant maltodextrin |                                                                                          | Daily fiber amounts > 50 g show significant improvements in health markers.<br>Tolerance to fiber is dependent on each individual and <u>often improves over time as the gastrointestinal tract and microbiota adapt to higher doses of dietary fiber.</u> |
| Mego, Manichanh., et al (2017) | Adults, 18–54 y of age                                                                                  | Galactooligosaccharide prebiotic administration (HOST-G904)                                                       | 2.8 g/d for 3 weeks (main study) + probe meal at interventions with 12g additional fibre | The availability of substrates induces an adaptation of the colonic microbiota activity in bacterial metabolism, which produces less gas and associated issues.                                                                                            |
| Mego, Accarino, et al., (2017) | Adults, 25-50 y of age                                                                                  | Galactooligosaccharide prebiotic administration (HOST-G904)                                                       | 2.8 g/d for 2 weeks (ancillary study) + normal diet                                      | Initially increased intestinal gas production and this increase declined back to baseline after 2 week administration.                                                                                                                                     |

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