Biome Prenatal+™ Probiotic

Mechanism of Action

MECHANISM OF ACTION

Nutrient requirements during pregnancy

Pregnancy is a time when there are greater demands for certain nutrients, to fulfil the needs of both the pregnant woman and the developing baby. It is vital that these nutritional needs are met, and the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) has made the following recommendations regarding supplementation of these key nutrients:

- **Folic acid**
  Neural tube defects such as spina bifida are associated with folic acid deficiency. Routine supplementation with at least 400mcg folic acid per day is recommended prior to conception and during the first trimester of pregnancy.
- **Iodine**
  RANZCOG recommends that women who are pregnant or considering pregnancy should take 150mcg of iodine daily. This mineral supports healthy neuropsychological development of the baby.
- **Vitamin D3**
  Women without a vitamin D deficiency should take 400iu of vitamin D3 daily. Foetal vitamin D deficiency is associated with low birth weight, rickets, and failure to thrive.
- **Vitamin B12**
  B12 is essential for healthy brain and nervous system development. The recommended daily intake (RDI) of vitamin B12 during pregnancy is 2.6mcg.

Gestational diabetes

During pregnancy, hormones produced by the placenta block the action of maternal insulin. This effect is usually overcome by the pancreas, which produces extra insulin to compensate, allowing blood glucose levels to remain within the normal range. However, in women who already have some degree of insulin resistance, blood glucose levels can rise above safe levels, potentially causing the developing baby to grow very quickly. Untreated gestational diabetes (GD) can result in several consequences for the baby, including: high birth weight; jaundice; breathing difficulties; hypoglycaemia.

GD is the fastest growing type of diabetes in Australia, which occurs in 12-14% of pregnancies. Pregnant women in Australia are offered screening for GD using an oral glucose tolerance test. GD is treated by controlling blood glucose levels, either through diet and exercise alone or with the addition of injected insulin. Although blood glucose levels typically return to normal after pregnancy, women who develop GD are at a significantly increased risk of developing type two diabetes during their lifetime.

Risk factors for GD include:

- Family history of GD or Type 2 Diabetes
- Age over 40
- BMI above 25 (pre-pregnancy)
- History of polycystic ovarian syndrome (PCOS)
- History of previous elevated blood glucose levels
- History of GD or large baby (4.5kg+) in previous pregnancy
- Certain ethnic backgrounds
- Current use of antipsychotic or steroid medications

Probiotics and glucose metabolism during pregnancy

A recent meta-analysis (Han et al 2019) of randomised controlled trials found that probiotic supplementation during pregnancy significantly reducing fasting blood glucose levels and serum insulin levels, and increased insulin sensitivity, compared to placebo. Further, the study found a significant effect of probiotic supplementation in reducing the risk of developing GD. The mechanism for the beneficial effect of probiotic supplementation on glucose metabolism is unclear, but is believed to be related to the production of short-chain fatty acids, which promote the release of hormones such as GLP-1 (Han et al 2019).

In summary, Biome Prenatal+ Probiotic provides necessary nutrients at the levels recommended for pregnant women in addition to probiotics, which may improve glucose metabolism and reduce the risk of developing GD.

REFERENCES

Diabetes Australia. https://www.diabetesaustralia.com.au/gestational-diabetes

He J, Zhang F, Han Y. Effect of probiotics on lipid profiles and blood pressure in patients with type 2 diabetes: A meta-analysis of RCTs. Medicine [Internet]. 2017 Dec [cited 2019 Nov 20];96(51):e9166. Available from: http://search.ebscohost.com.ezproxy.utas.edu.au/login.aspx?direct=true&db=mdc&AN=29390450&site=eds-live

Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Vitamin and mineral supplementation and pregnancy. 2017. https://ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Vitamin-and-mineral-supplementation-in-pregnancy-(C-Obs-25)-Review-Nov-2014,-Amended-May-2015_1.pdf?ext=.pdf

Han M-M, Sun J-F, Su X-H, Peng Y-F, Goyal H, Wu C-H, et al. Probiotics improve glucose and lipid metabolism in pregnant women: a meta-analysis. Annals of Translational Medicine. 2019 Mar;7(5):99–99.