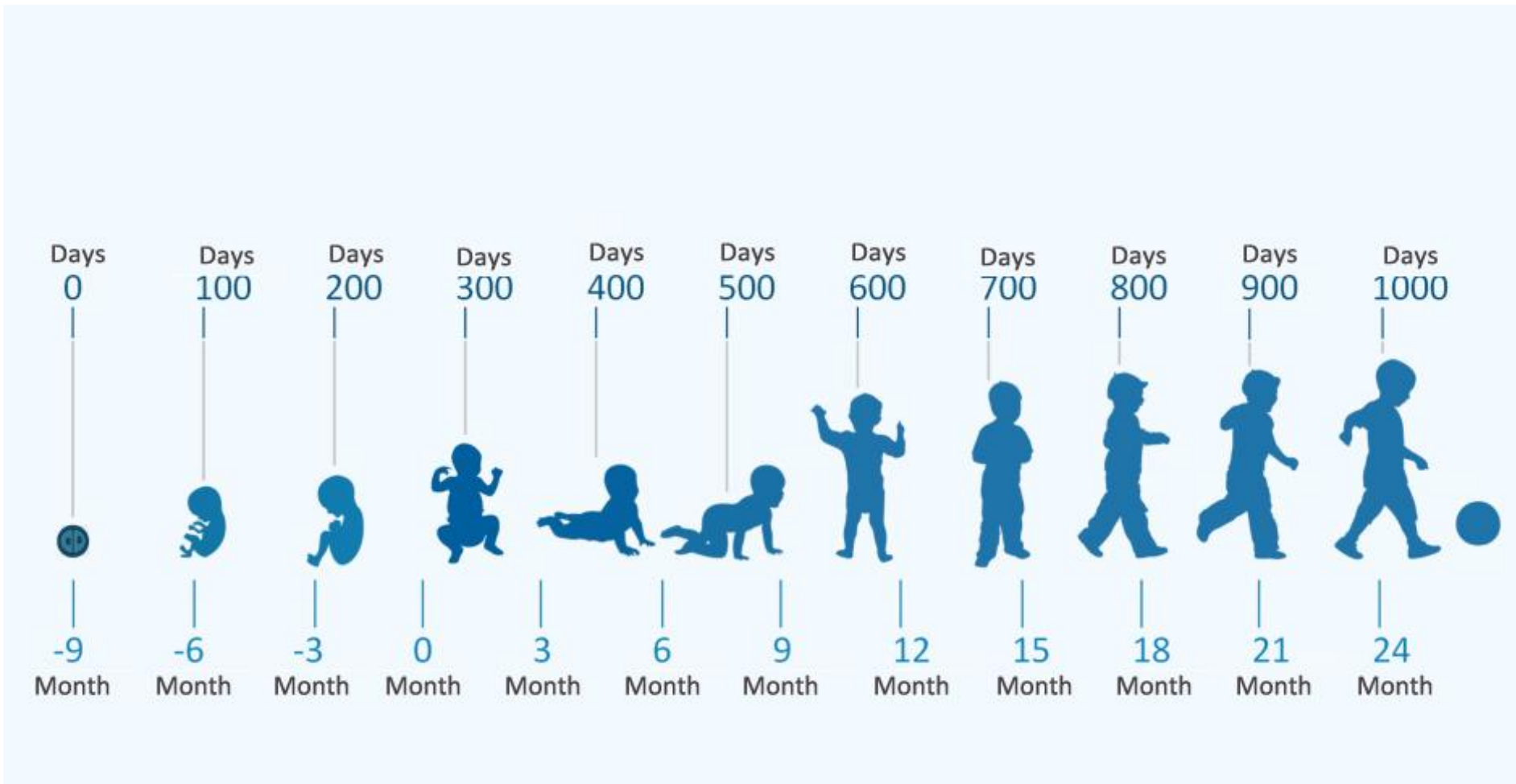




O Microbioma ao longo do ciclo de vida – Uma Visão da Medicina Humana

PROFA. ASSOC. CARLA TADDEI – ICB/USP





Fetal meconium does not have a detectable microbiota before birth

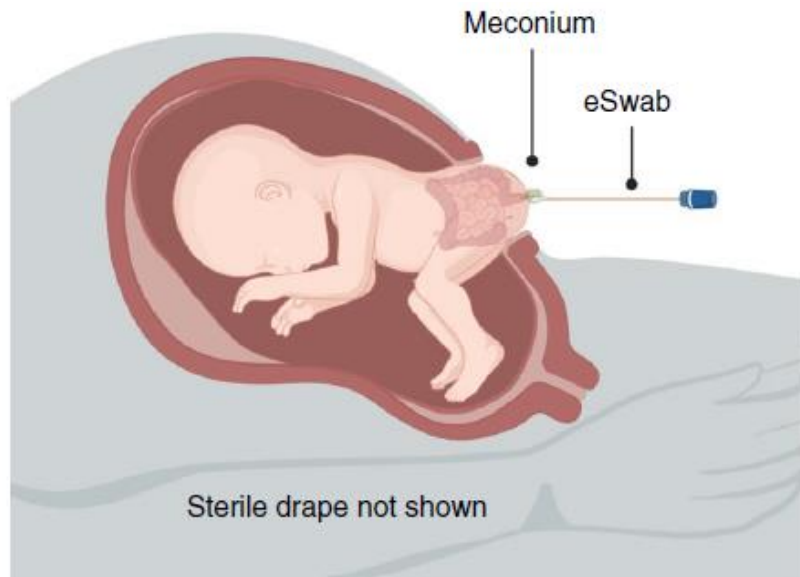


Fig. 1 | Diagram of the collection method for fetal meconium samples. After advanced physical disinfection of maternal skin from maternal armpits to knees, the surgical area was covered using a specialized sterile drape, with the film remaining intact until the incision. After caesarean section and exposure of the fetal buttocks before birth, meconium was rectally sampled using sterile eSwabs. Image created with BioRender.com.

Table 2 | Fetal meconium culture results

| Sample ID | Anaerobic culture | | Aerobic culture | |
|---------------------|-------------------------------------|---------------------|-------------------------------|---------------------|
| | Result | Incubation time (h) | Result | Incubation time (h) |
| M201 ^a | <i>S. epidermidis</i> | 18.64 | <i>S. epidermidis</i> | 23.2 |
| M202 | <i>S. epidermidis</i> | 18.68 | <i>S. lugdunensis</i> | 20.67 |
| M203 ^b | <i>S. epidermidis</i> | 20.12 | <i>S. epidermidis</i> | 14.92 |
| M204 ^{a,b} | <i>S. epidermidis</i> | 18.59 | <i>S. epidermidis</i> | 17.09 |
| M205 ^a | Negative | 120.07 | Negative | 120.07 |
| M206 | <i>Staphylococcus saprophyticus</i> | 26.09 | <i>S. saprophyticus</i> | 17.96 |
| M207 ^a | <i>S. epidermidis</i> | 19.06 | <i>S. lugdunensis</i> | 18.69 |
| M208 | <i>S. epidermidis</i> | 22.05 | Negative | 120.08 |
| M209 | Negative | 120.07 | Negative | 120.08 |
| M210 | <i>P. acnes</i> | 79.21 | Negative | 120.08 |
| M211 | Negative | 120.08 | Negative | 120.09 |
| M212 | <i>S. epidermidis</i> | 19.94 | <i>Staphylococcus hominis</i> | 24.29 |
| M213 | <i>P. acnes</i> | 102.77 | <i>S. capitis</i> | 36.68 |
| Neg | Negative | 120.02 | Negative | 120.03 |
| M215 | Negative | 120.13 | Negative | 120.13 |
| M216 | Negative | 120.16 | Negative | 120.15 |
| M217 | <i>P. acnes</i> | 66.24 | Negative | 120.17 |
| M219 | Negative | 120.08 | <i>S. epidermidis</i> | 17.41 |
| M221 | Negative | 120.08 | Negative | 120.08 |
| M222 | Negative | 120.08 | Negative | 120.09 |
| M223 | <i>P. avidum</i> | 80.85 | <i>P. avidum</i> | 99.05 |

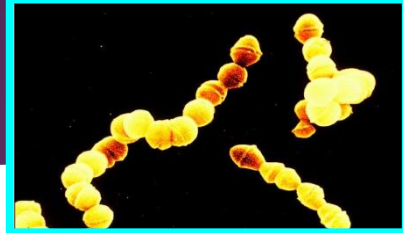
^aNot breech presentation. ^bMonochorionic diamniotic twins. Bacterial species detected in fetal meconium by anaerobic and aerobic culture. Cultures were maintained until detection or for a maximum of 120 h.

DISCUSSÃO- SUCESSÃO MICROBIANA DESCRITA

Anaeróbios facultativos



E. coli



Streptococcus

~~OXIGÊNIO~~

Anaeróbios

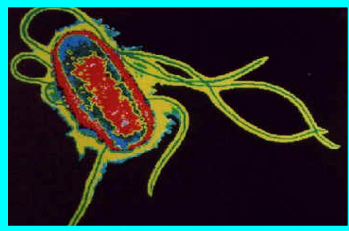
Produção de AGCC



Bifidobacterium



Bifidobacterium



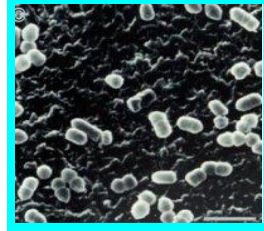
E. coli



Lactobacillus



Bacteroides



Prevotella

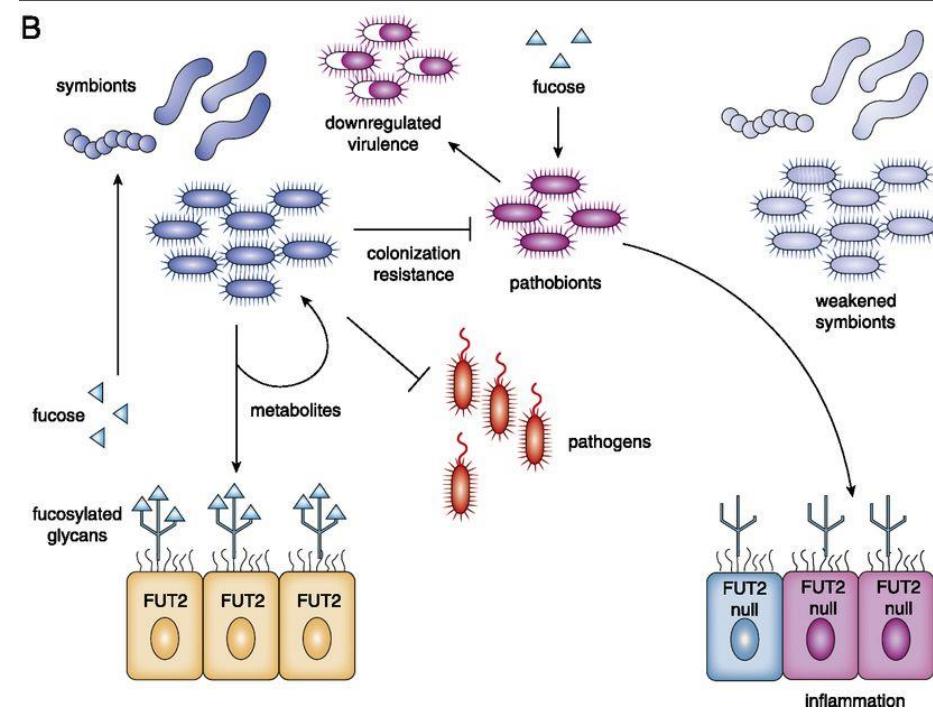
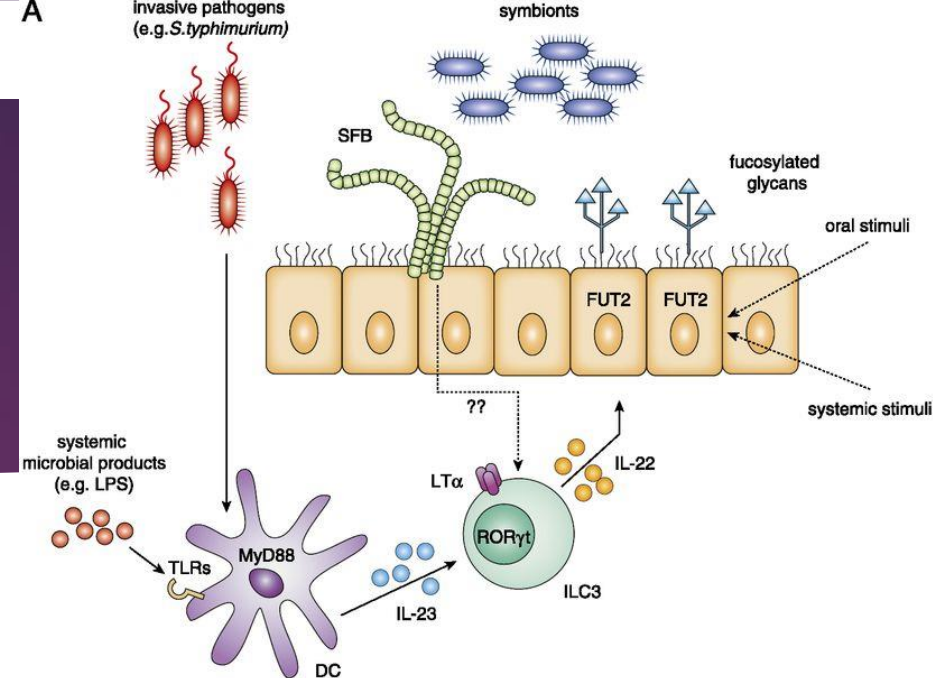
1º dia

10 dias

1 mês

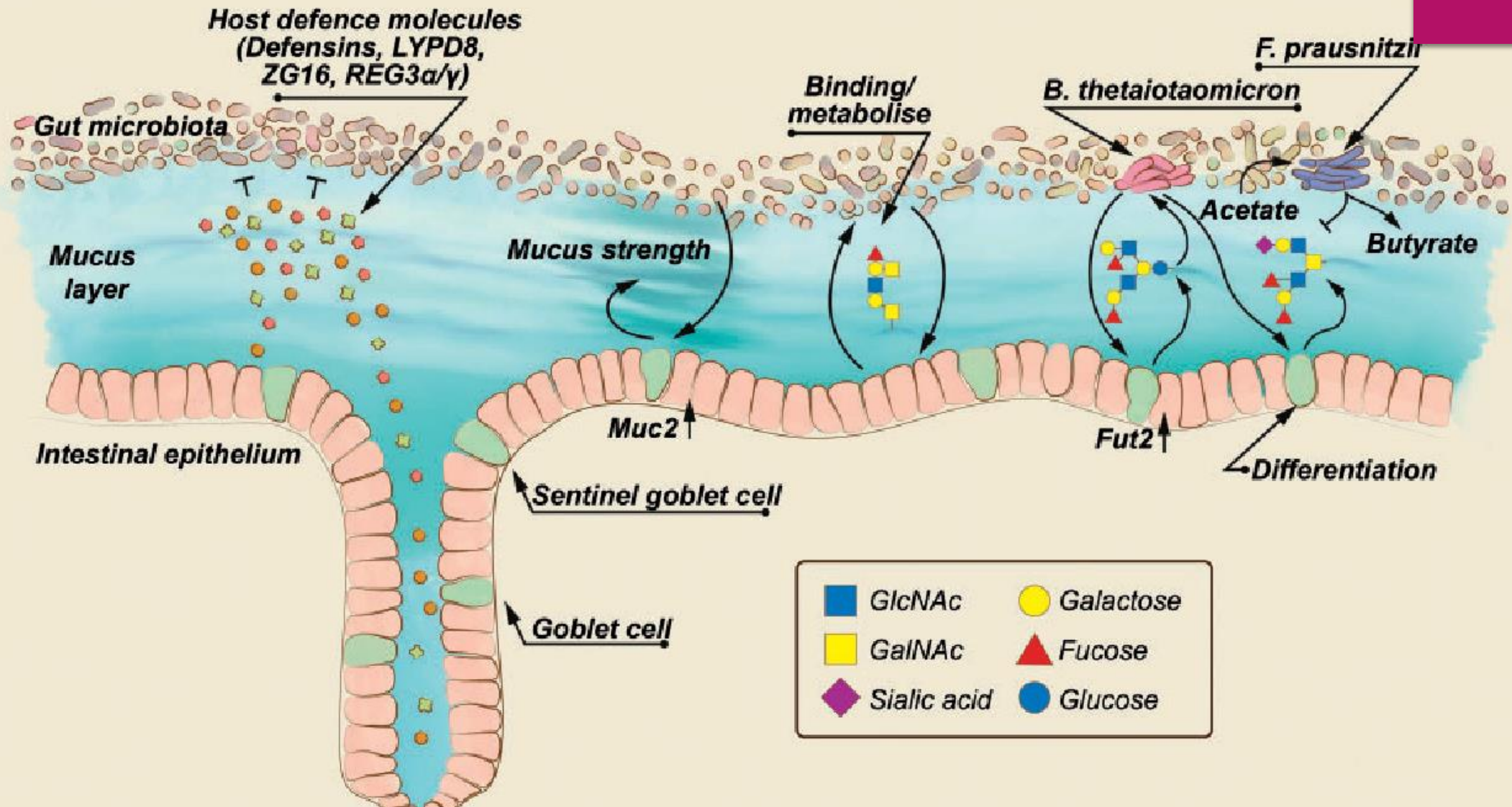
Fucosiltransferase

- Fut 2: genes que expressam glicanos nas células endoteliais.
- Facilitação de alguns microrganismos específicos no intestino – ativação de sistema inume
- Fucose é liberada por fucosidades bacterianas
- Fucose livre inibe fatores de virulência bacterianos
- Deleções em Fut2 - inflamação



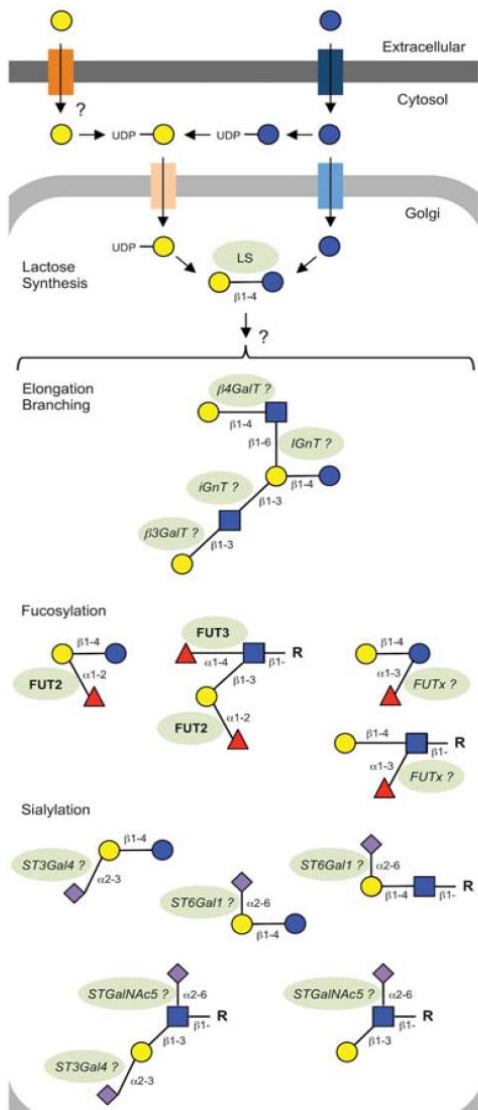
Estágio primário de colonização

- Depende da quantidade de acúmulo de metabólitos bacterianos
- Succinato e lactato (anaeróbios facultativos)
- lactato e succinato estimulam expressão de fut2 e muc 4 – muco
- Mucosa intestinal rica em ácido siálico – e pobre em glicano fucosilado
- Perfil muda com desenvolvimento e maturação da mucosa – novos gêneros são favorecidos

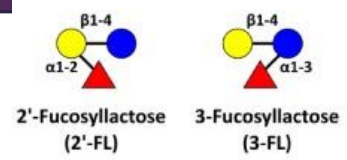


•DOI:10.1093/gastro/goy052

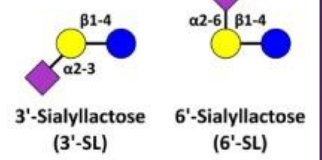
Fight them or feed them: how the intestinal mucus layer manages the gut microbiota



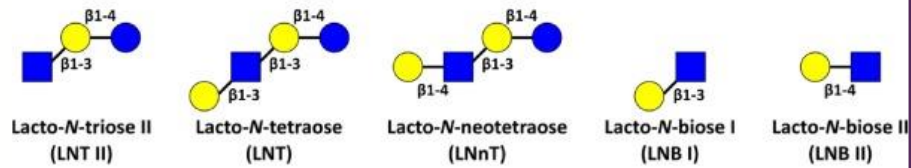
Fucosylated lactose:



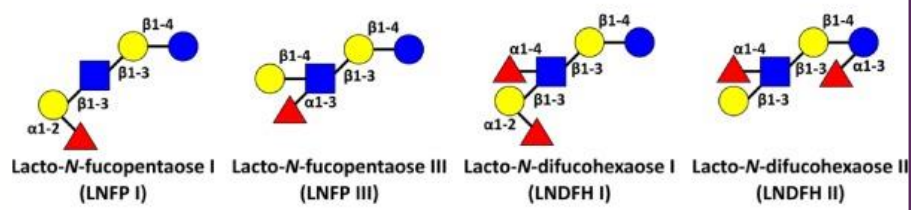
Sialylated lactose:



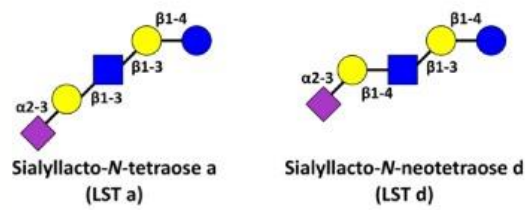
Core structures:



Fucosylated core structures:



Sialylated core structures:

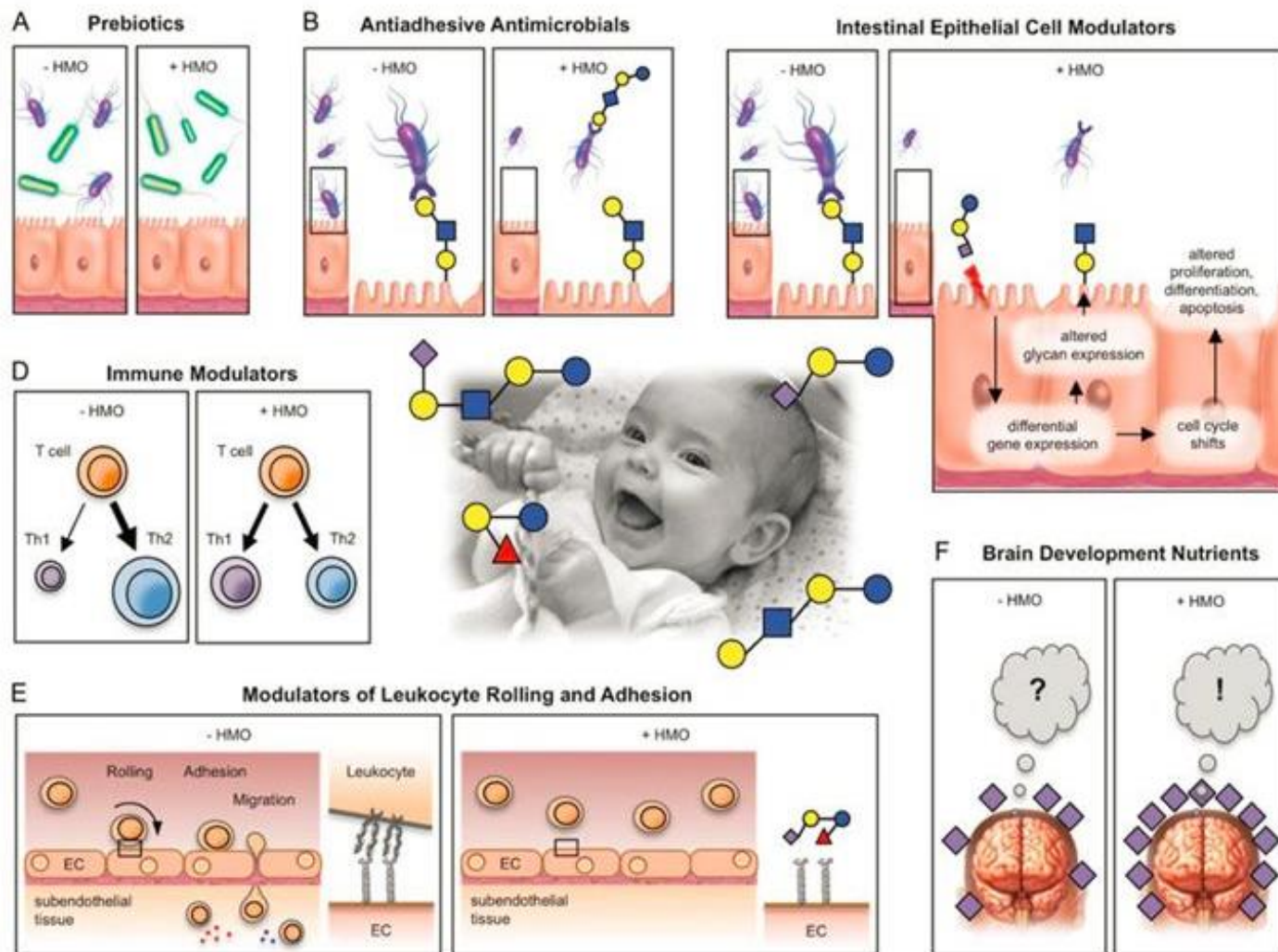


Oligossacarídeos do leite materno (HMO)

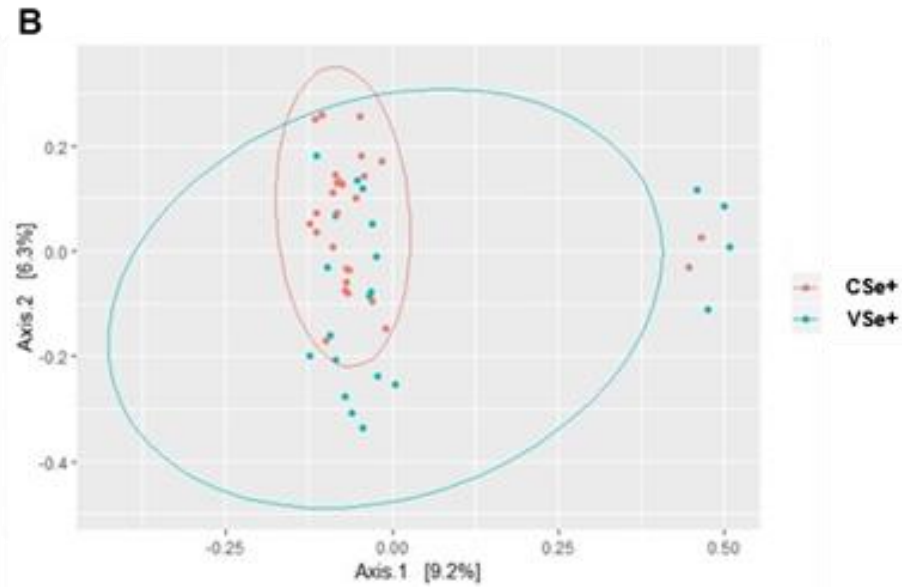
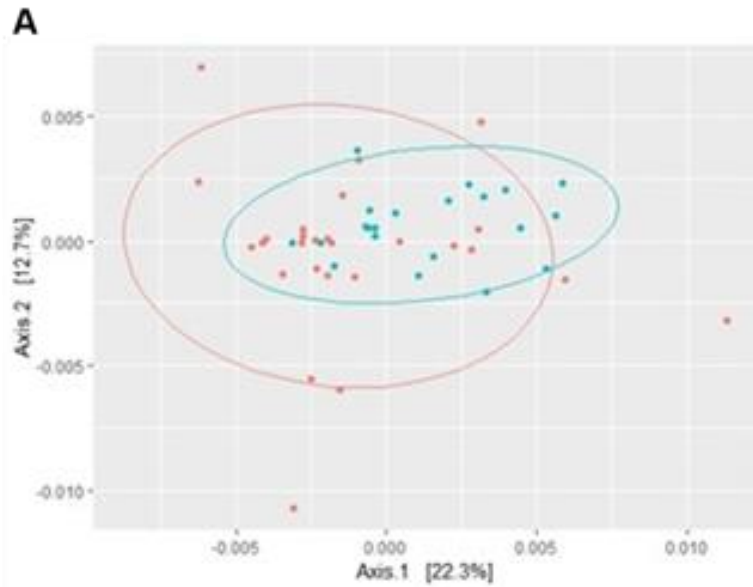
diversidade dependente do gene *Fut*

Se + : expressa FUT2
 Se - : não expressa FUT2
 Le + : expressa FUT3
 Le - : não expressa FUT3

Enzyme-catalysed synthetic HMO production setup



Bode L Glycobiology 2012;22:1147-1162

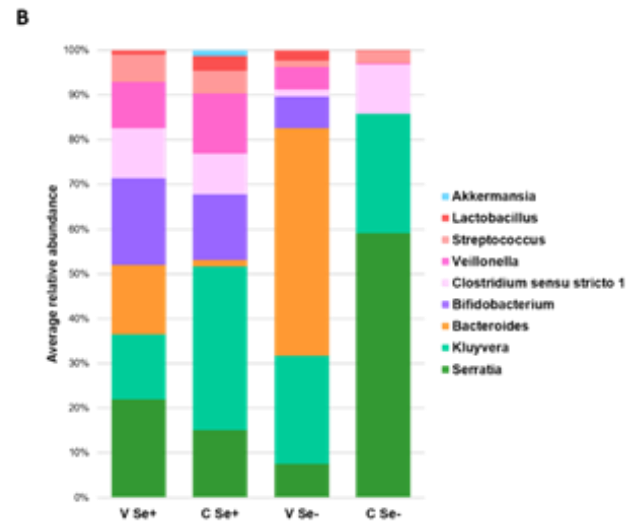
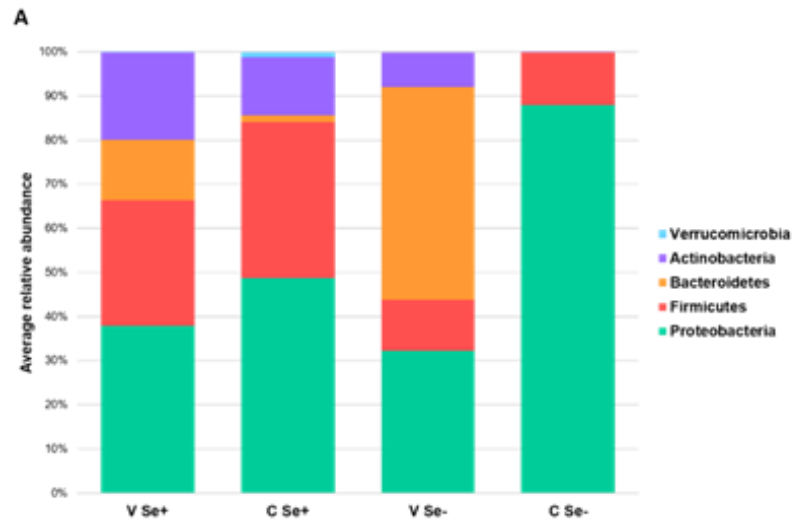


Fut2 secretory and non secretory women

HMO

C section and vaginal delivery

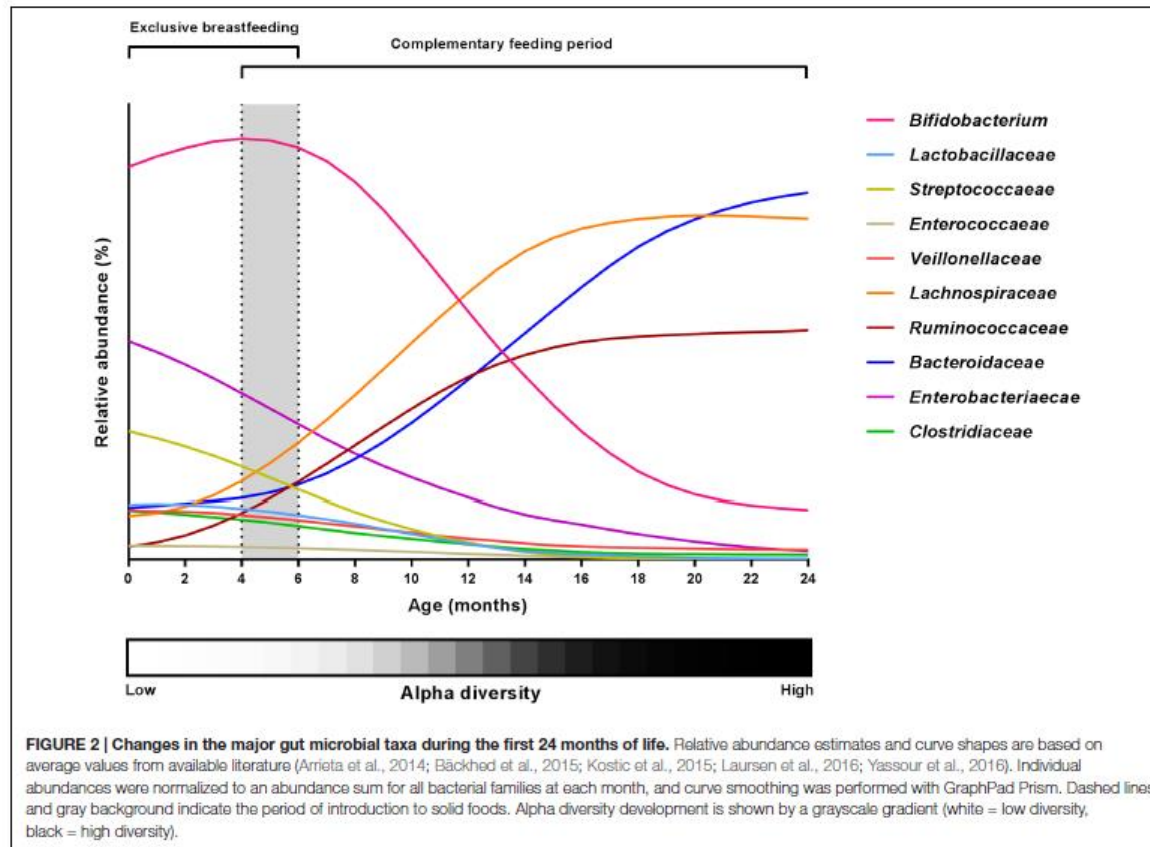
Babies intestinal microbiome

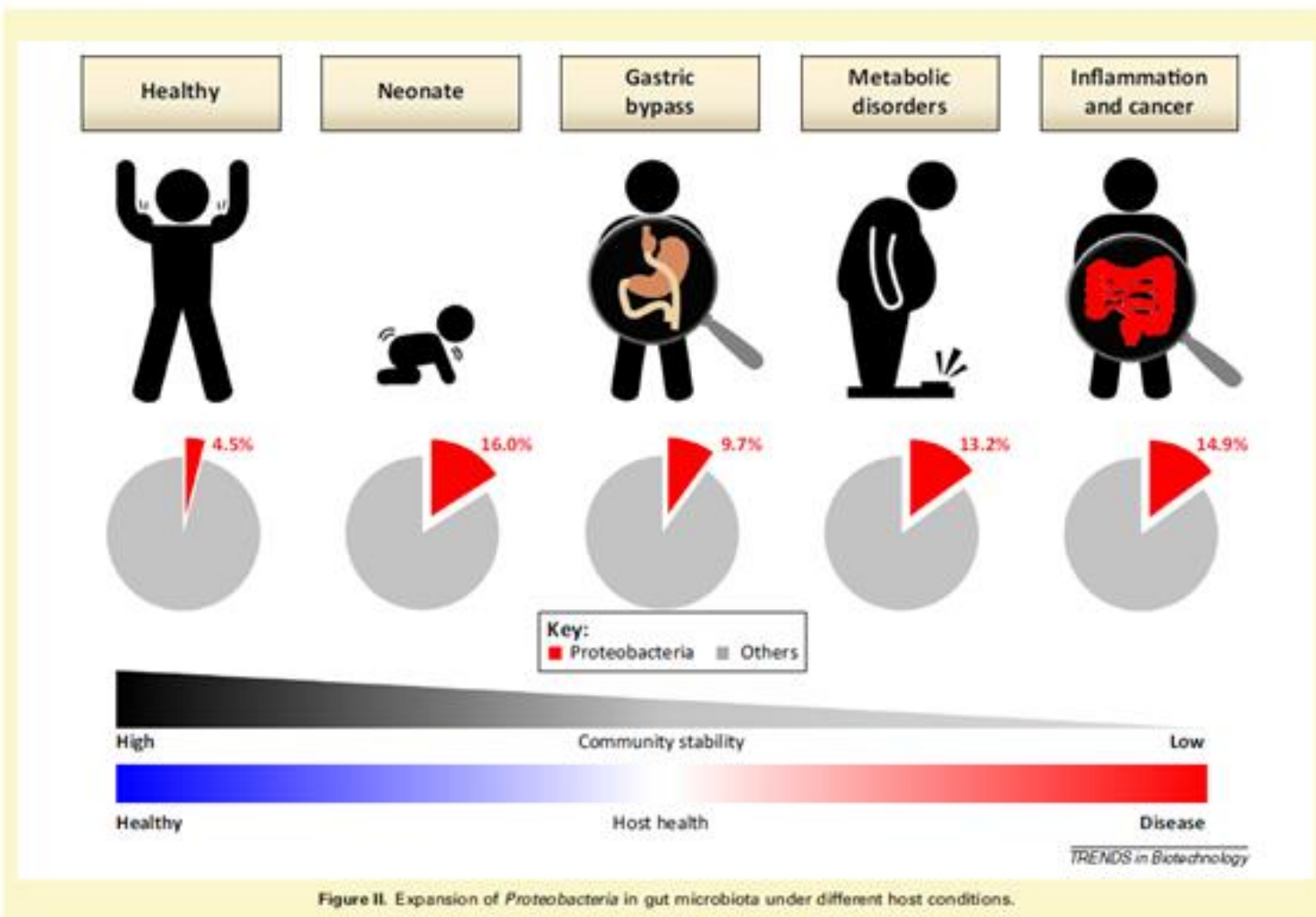


Desmame e introdução de alimentos sólidos

Laurson et al.

First Food and Gut Microbes



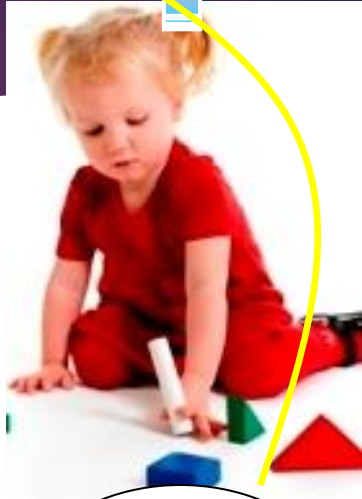
Figure II. Expansion of *Proteobacteria* in gut microbiota under different host conditions.

Baixa prevalência de atopia e doenças auto-imunes

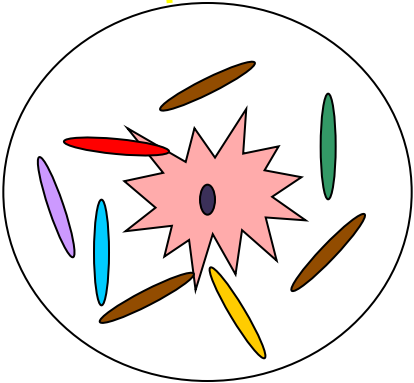
Regulação TH

Desequilíbrio TH

Elevada prevalência de atopia e doenças auto-imunes

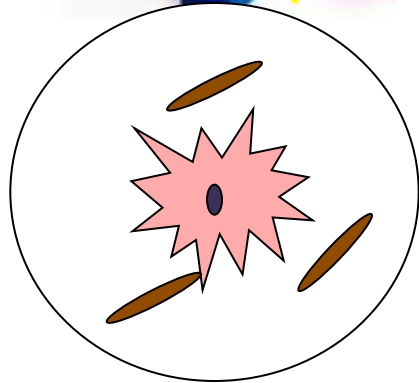


Teoria da higiene



Ambiente contaminado

SI reage a antígenos ambientais



Elevada higiene ambiental

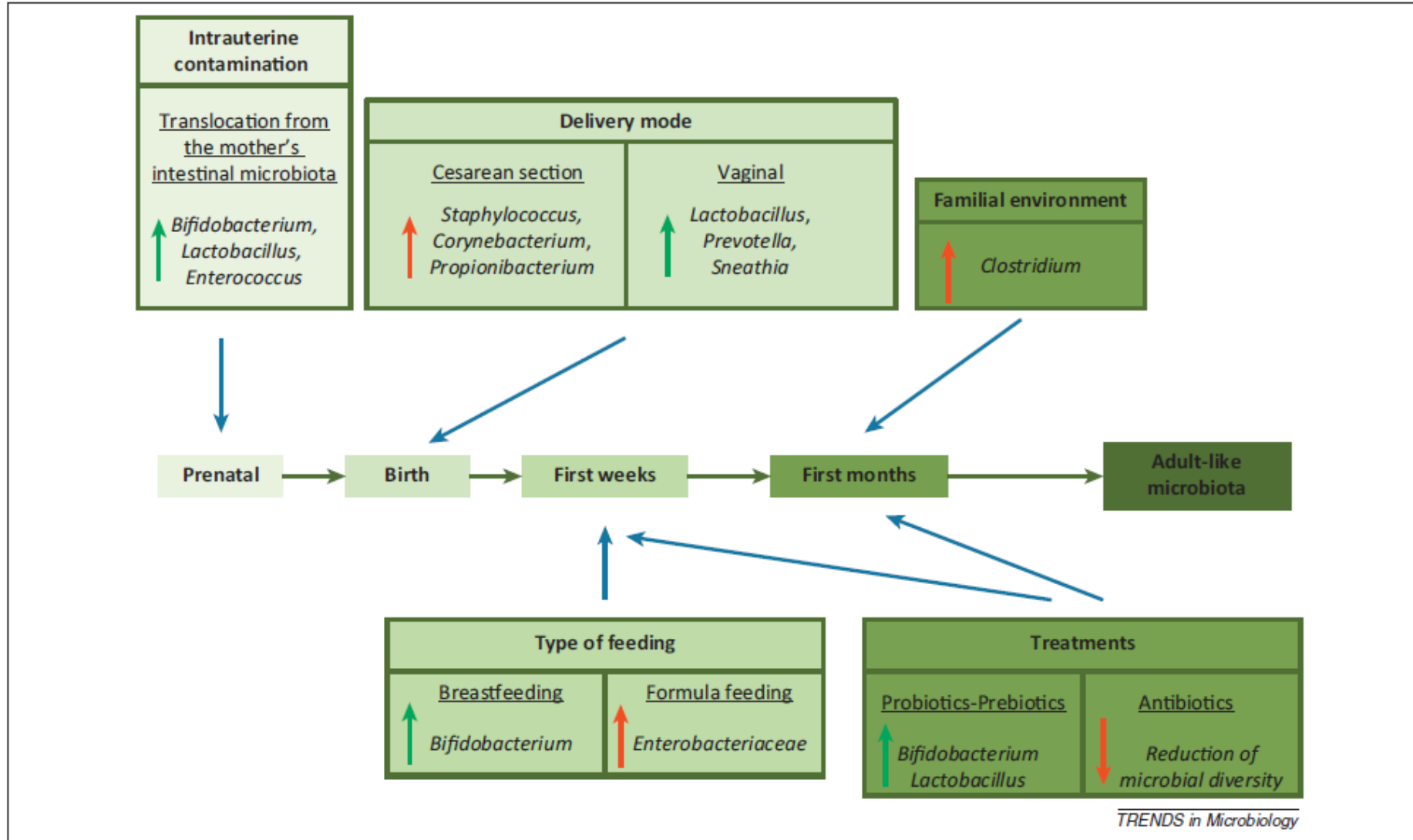


Figure 1. Impact of external factors on the intestinal microbiota of the infant. Green arrows show beneficial modification; red arrows show modification considered negative for healthy development.

The cost of not breastfeeding: global results from a new tool

Dylan D. Walters^{1,*}, Linh T. H. Phan² and Roger Mathisen²

¹Nutrition International, 180 Elgin St, Ottawa, ON, K2P 2K3, Canada and ²Alive & Thrive, 60 Ly Thai To Street, Hoan Kiem, Ha Noi, Viet Nam

Table 1 Number of annual cases of morbidity in women and children attributable to not breastfeeding by region and country income group

Number of cases of morbidity attributable to not breastfeeding

| Regions | Child diarrhoea (0–23 months) | Child ARI/ pneumonia (0–23) | Childhood obesity | Breast cancer in mothers | Ovarian Cancer in mothers | Type II diabetes |
|------------------------------|-------------------------------|-----------------------------|-------------------|--------------------------|---------------------------|------------------|
| East Asia and Pacific | 19 533 482 | 1 058 553 | 374 405 | 54 393 | 9 905 | 389 006 |
| Europe and Central Asia | 3 514 920 | 357 835 | 69 231 | 11 016 | 3 214 | 52 077 |
| Middle East and North Africa | 12 704 537 | 716 047 | 168 568 | 8379 | 902 | 101 441 |
| Latin America and Caribbean | 13 160 409 | 778 792 | 134 192 | 18 254 | 3 355 | 118 363 |
| North America | 33 571 | 64 739 | 0 | 0 | 0 | 0 |
| South Asia | 56 056 468 | 3 346 020 | 74 249 | 14 051 | 2435 | 121 620 |
| Sub-Saharan Africa | 60 843 179 | 2 317 553 | 154 311 | 11 711 | 1745 | 75 009 |
| High income | 335 534 | 86 075 | 9362 | 3249 | 728 | 15 719 |
| Upper-middle-income | 24 816 631 | 1 706 300 | 528 011 | 68 921 | 12 696 | 494 165 |
| Lower-middle-income | 99 358 380 | 5 375 448 | 356 162 | 39 297 | 7230 | 313 822 |
| Low income | 41 336 021 | 1 471 716 | 81 421 | 6337 | 902 | 33 809 |
| Total | 165 846 566 | 8 639 539 | 974 956 | 117 804 | 21 556 | 857 515 |

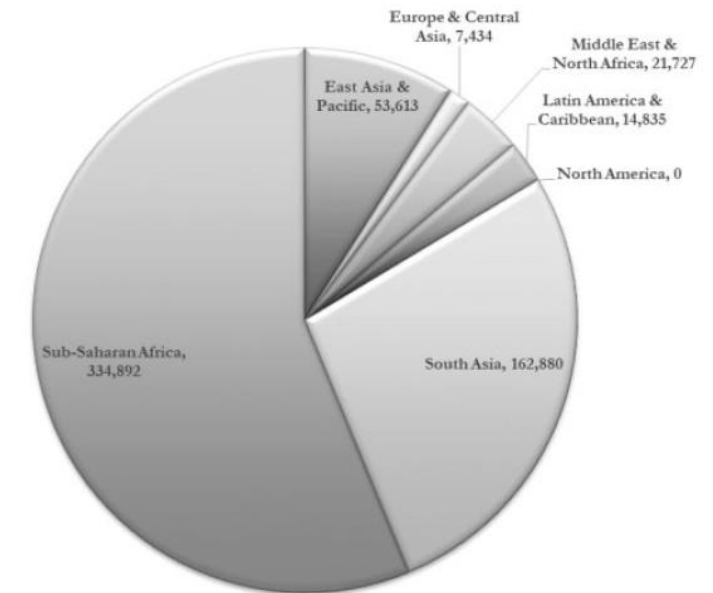


Figure 2 Number of child deaths attributed to not breastfeeding by region.



BREASTFEEDING

It Rocks!

Obrigada!!



Carla Taddei crtaddei@usp.br

