

Supplementary Tables:

Table S1. Perinatal characteristics of premature babies. BW (birth weight), GA (gestational age), DH (days at hospital), AB (antibiotics). OMM: own mother milk; DHM: donor human milk; FORM: formula milk groups

		BW (gr, mean±SD)	GA (weeks, mean±SD)	DH (days, mean±SD)	Delivery mode (% vaginal)	Gender (% girl)	Infant AB (%)	Mother AB (%)
2d	OMM (n=26)	1351.73±353.31	30.88±2.44	46.04±26.98	46.15	38.46	80.77	3.85
	DHM (n=12)	1246.67±302.42	30.25±2.70	50.17±33.09	41.67	50.00	75.00	16.67
	<i>p. value</i>	0.23	0.40	0.98	0.80	0.50	0.69	0.17
10d	OMM (n=27)	1332.78±341.50	30.89±2.38	46.44±26.14	44.44	37.04	77.78	3.70
	DHM (n=12)	1240±296.55	29.92±2.43	50.83±32.61	41.67	58.33	75.00	16.67
	<i>p. value</i>	0.30	0.15	0.99	0.87	0.22	0.85	0.16
30d	OMM (n=13)	1273.46±362.51	30.62±3.28	51.31±31.01	53.85	38.46	84.62	7.69
	DHM (n=5)	1007±257.04	28.40±1.81	79±33.70	40.00	40.00	60.00	20.00
	FORM (n=20)	1409.75±279.91	31.43±1.36	39.25±17.94	35.00	45.00	80.00	5.00
	<i>p. value</i>	0.04 (DHM vs FORM)	0.04 (DHM vs FORM)	0.03 (DHM vs FORM)	0.56	0.93	0.51	0.54
90d	OMM (n=3)	1235±564.51	29.67±5.13	62.33±57.95	66.67	33.33	100.00	0.00
	FORM (n=23)	1287.17±357.78	30.55±1.97	50.22±27.8	34.78	47.83	78.26	4.35
	<i>p. value</i>	1.00	1.00	1.00	0.29	0.64	0.37	0.71

Table S2. Levels (Log n° cells /gram of feces) of different *Bifidobacterium* species determined by quantitative PCR in the feeding type groups. Median and interquartile range values are represented. OMM: own mother milk; DHM: donor human milk; FORM: formula milk groups; BDL: below detection limit. OMM 90 days: median (mín-max) showed. LD: 4.36 (*B. bifidum*), 5.37 (*B. breve*), 5.30 (*B. catenulatum*), 4.28 (*B. dentium*), 4.73 (*B. longum*), 5.14 (*B. angulatum*), 4.00 (*B. adolescentis*) 4.93 (*B. animalis*).

		<i>B. bifidum</i>	<i>B. breve</i>	<i>B. catenulatum</i>	<i>B. dentium</i>	<i>B. longum</i>	<i>B. angulatum</i>	<i>B. adolescentis</i>	<i>B. animalis</i>
2 days	OMM	BDL	BDL	BDL	BDL (BDL - 4,43)	4,74 (BDL - 4,94)	5,22 (5,17 - 5,26)	BDL	4,96 (BDL - 5,67)
	DHM	BDL (BDL - 4,58)	BDL	BDL	BDL	4,95 (BDL - 5,52)	5,17 (BDL - 5,21)	BDL	4,93 (BDL - 5,24)
10 days	OMM	4,44 (BDL - 4,63)	BDL	BDL	BDL	4,79 (BDL - 5,22)	5,19 (5,17 - 5,29)	BDL (BDL - 4,10)	5,08 (BDL - 5,64)
	DHM	BDL (BDL - 4,47)	BDL	BDL (BDL - 5,47)	BDL (BDL - 4,59)	BDL (BDL - 6,16)	5,17 (BDL - 5,23)	BDL	BDL (BDL - 5,53)
30 days	OMM	BDL (BDL - 4,80)	5,83 (BDL - 8,67)	BDL (BDL - 5,45)	BDL (BDL - 4,66)	6,11 (BDL - 8,49)	5,24 (BDL - 5,28)	BDL	5,32 (BDL - 5,87)
	DHM	4,52 (4,40 - 6,35)	BDL (BDL - 5,45)	BDL	4,52 (BDL - 7,47)	4,89 (BDL - 5,36)	5,20 (5,18 - 5,25)	BDL	5,20 (BDL - 5,42)
	FORM	4,54 (BDL - 5,06)	7,80 (BDL - 8,98)	BDL	BDL (BDL - 5,15)	5,28 (BDL - 7,20)	5,18 (BDL - 5,24)	BDL (BDL - 4,15)	5,66 (5,08 - 5,96)
90 days	OMM	4,42 (BDL - 8,52)	8,88 (BDL - 9,40)	5,56 (BDL - 10,56)	BDL	8,15 (5,17 - 9,15)	5,19 (BDL - 5,22)	BDL	5,59 (BDL - 5,92)
	FORM	4,65 (BDL - 6,75)	7,86 (6,41 - 8,61)	BDL	BDL (BDL - 4,63)	5,31 (4,78 - 7,97)	5,18 (5,15 - 5,29)	BDL (BDL - 4,27)	5,67 (5,16 - 6,12)

Table S3. Levels (mM) of the main SCFAs determined by GC in the feeding type groups. Median and interquartile range values are represented. OMM: own mother milk; DHM: donor human milk; FORM: formula milk groups. OMM 90 days: median (min-max) showed. * indicate significant differences (p .value<0.05) among feeding groups.

		Acetate	Propionate	Butyrate	Total SCFAs
2 days	OMM	18,48 (10,24 - 24,36)	1,11 (1,11 - 1,11)	0,90 (0,91 - 0,90)	20,49 (12,25 - 26,39)
	DHM	19,18 (15,01 - 24,6)	1,11 (1,11 - 1,11)	0,90 (0,90 - 0,90)	21,77 (17,11 - 26,61)
10 days	OMM	24,64 (20,59 - 33,19)	1,11 (1,11 - 1,18)	0,90 (0,90 - 0,90)	26,73 (22,60 - 37,31)
	DHM	28,73 (24,04 - 34,18)	1,16 (1,11 - 2,15)	0,90 (0,90 - 2,36)	32,09 (26,05 - 38,46)
30 days	OMM	28,41 (22,2 - 63,15)	1,85 (1,11 - 4,41)	0,90 (0,90 - 3,26)	30,42 (26,71 - 76,94)
	DHM	22,29 (14,62 - 51,37)	6,16 (3,35 - 9,37)	5,00 (0,90 - 10,38)	38,02 (20,77 - 66,94)
	FORM	35,45 (28,71 - 57,86)	3,66 (2,51 - 6,43)	4,22 (1,46 - 7,65)	46,31 (36,32 - 69,38)
90 days	OMM	99,24 (24,96 - 144,71)	4,35 (2,38 - 7,32)*	0,90 (0,90 - 0,90)*	102,53 (33,19 - 149,97)
	FORM	69,49 (46 - 95,12)	12,34 (7,61 - 16,51)	6,04 (1,8 - 12,31)	82,01 (65,88 - 122,43)

Supplementary Figures:

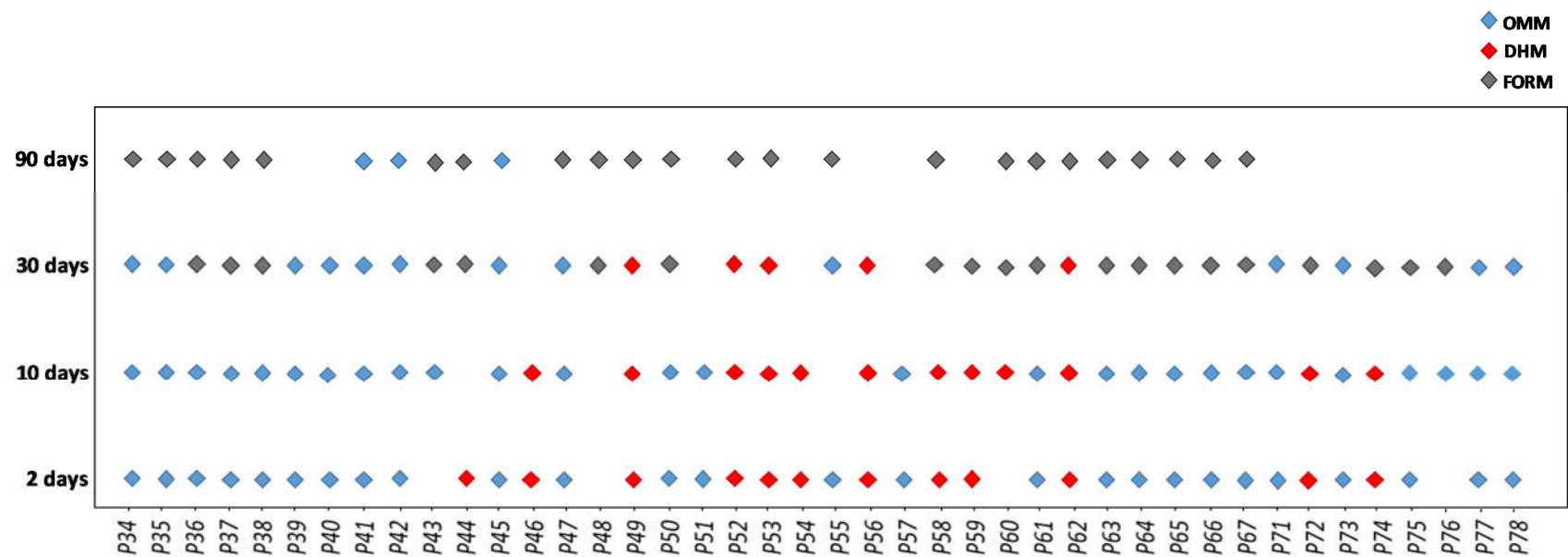


Figure S1. Feeding type distribution among the premature babies included in this study over the time. OMM: own mother milk; DHM: donor human milk; FORM: formula milk groups.

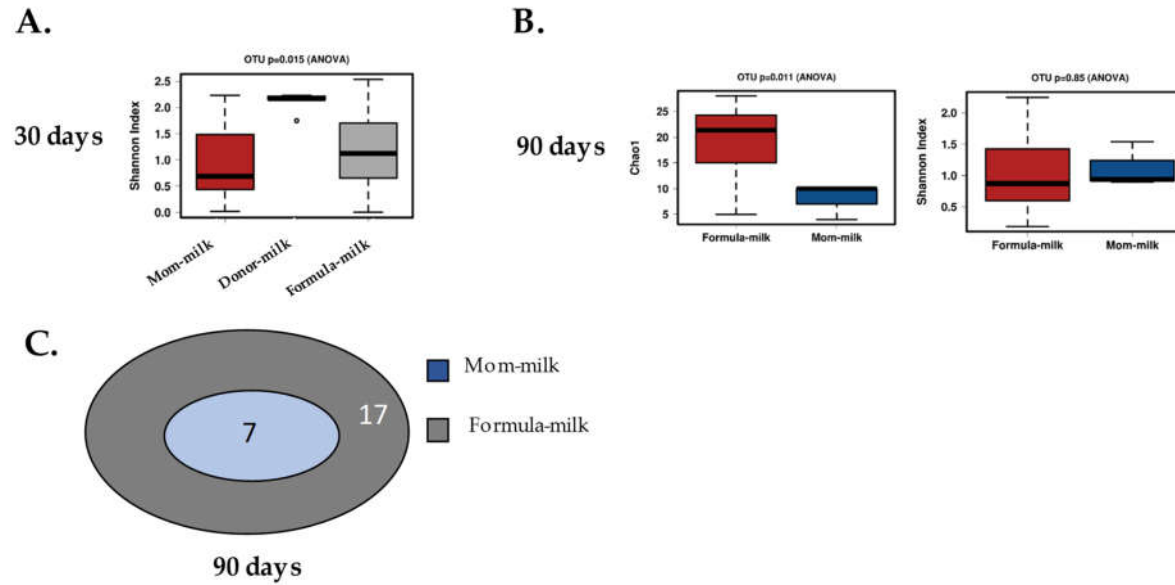


Figure S2. *Bifidobacterium* diversity. (A) Alpha-diversity between groups. Chao1 and Shannon indexes comparison between Donor (DHM), Mom (OMM) and Formula milk groups at 30 days of life. (B) Alpha-diversity over time. Chao1 and Shannon indexes comparison between Mom (OMM) and Formula milk groups at 90 days of life. (C) Venn diagram. Number of unique and shared species in the babies' groups at 90 days. Colours and groups explained in each figure.

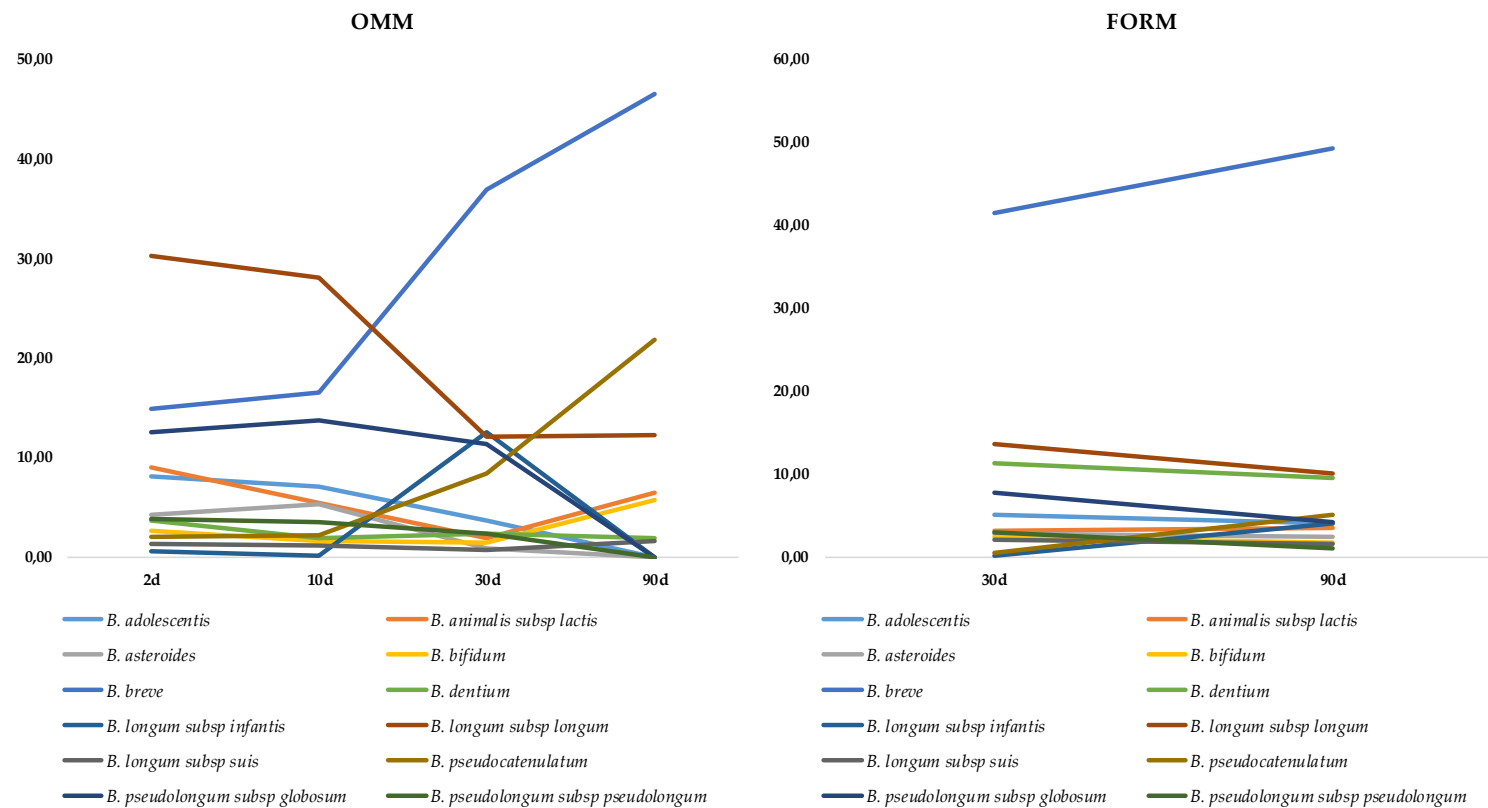


Figure S3. *Bifidobacterium* evolution. Evolution of *Bifidobacterium* species in (A) mom milk (OMM) group and in (B) formula milk (FORM) group during the first three months of life.

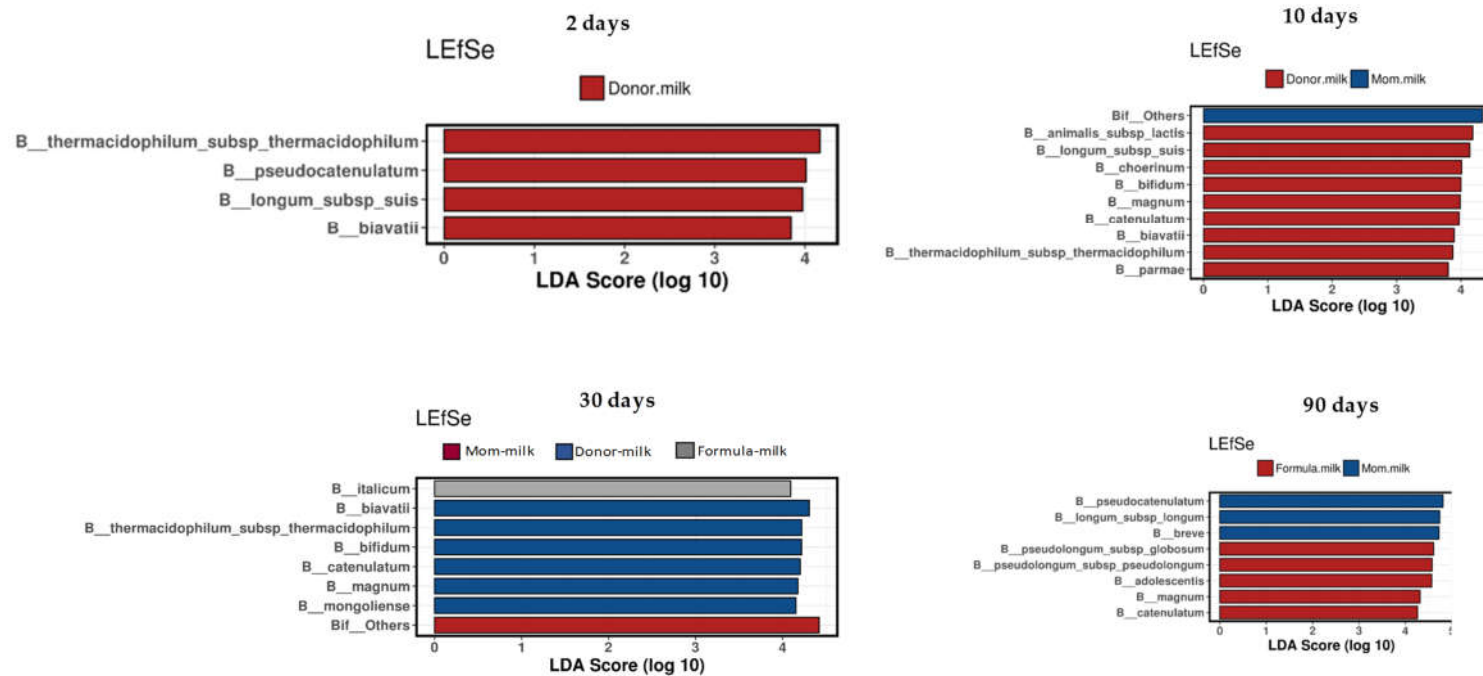


Figure S4. Differential species. Linear discriminant analysis (LDA) combined with effect size measurement (LEfSe) show the most differentially abundant *Bifidobacterium* species over time among feeding type. Colours and groups explained in each figure.