**Supplemental Table 4. Differences in Neonatal Outcomes in Infants Exposed to Mother’s Own Milk versus Donor Human Milk**

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| **Authors Location*****Level of Evidence*** | **Project/Research Design****Sample** | **Outcomes** ***Time of Measurement*** | **Results** | **Limitations*****Strengths*** | **Implications** |
| **Human milk feeding type effects on growth parameters and neonatal morbidity as primary outcome** |  |
| **Brownell et al.27** **U.S.A.***III A* | Retrospective cohort Sample < 32wks GA < 1800 g birthweightN=314MOM used as reference (% of total vol & total vol received compared to DHM & PF) *Fortifier: bovine-based HMF (up to 20 Kcal/oz)* | **Outcome Measures** Growth parameters (Wt, HC, length, & z-scores for all parameters) *(36 wks PMA or DC)* |  Wt by 0.17g for every 10% in  DHMHC signif by in DHM Length not associated with DHM intake Wt *z*-scores signif with % DHM  HC *z*-scores signif with % DHM Length *z*-scores not associated with DHM intake Dose-response relationship between  DHM intake & slower growth relative to MOM intake | Observational designUnable to reliably measure amount of fortification received*Classified exposures as exact daily amount received for MOM & DHM**Multivariable approach to model 10% increment change in proportion of diet on growth* | Wt gain correlated with % of MOM feedingResults modeled on an additive scale (10% increments) make it a practical approach for application in clinical practice |
| **Colaizy et al.28** **U.S.A.***III A* | Prospective cohort Sample < 1250 g birthweightN= 171 (main study)3 cohorts Subanalysis (sample receiving > 75% of human milk) (N= 88)>75% MOM, n=51>75% DHM, n=23 MOM/DHM, n=14 *Fortifier: bovine-based HMF (up to 24 Kcal/oz)* | **Outcome Measures**Primary-Wt z-scores for PMASecondary- growth parameters (WT & HC at DC, & SGA status at DC), NEC, ROP, IVH, & LOS*(birth to DC)* | Subanalysis data onlyWt *z*-score from birth to DC, Wt & HC *z*-scores at DC, did not differ signif by HM type DHM associated with rates of growth failure at DC (<10th percentile for PMA (small for gestational age (SGA), p=0.08)Higher rates of SGA at DC for DHM fed infants (56%) compared to MOM (35%) or MOM/DHM (21%) feeding groups (p= 0.08)No signif between-group differences in neonatal morbidities (NEC, LOS, ROP, & IVF)  | Observational designSubanalysis sample size not powered to measure all variablesWt data collected at birth & DC onlyLinear growth data not obtained*Prospective data collection**Use of z-scores to assess growth parameters* | DHM feeding may be associated with more growth challenges than MOM feeding |
| **Dritsakou et al.29****Greece***III B* | Prospective cohort Sample < 1250 g birthweightN= 384 (2 groups)70% MOM & 30% DHM, n=192 DHM first 21 days then transitioned to PF, n=192 *Fortifier: bovine-based HMF (up to 120-130 kcal/kg/day depending on birth weight)* | **Outcome Measures** Growth parameters (Wt, HC, length),Secondary- HCAIs, NEC, ROP, IVH, feeding intolerance, length of stay *(first 21 days postnatally & DC)* | No signif between-group differences in Wt at DCCompared to DHM group, MOM group regained birth Wt earlier; with > body length & HC at DC; started feeds earlier, < episodes of feeding intolerance, & shorter length of stayMOM group with rates of HCAIs, NEC, ROP, IVH, but differences non-significant | Observational designDHM group switched to PF on 3rd wk per protocol*Prospective data collection* | Higher growth velocity and better feeding tolerance with aggressive MOM feeding early in life |
| **Madore et al.35****U.S.A.***III B* | Retrospective cohort Sample < 32wks GA< 1000 g birthweightN= 81 (3 cohorts)Exclusive MOM first 30 days, n=29>50% DHM, n=27 >50% PF, n=25 *Fortifier: bovine-based HMF (up to 24 Kcal/oz)* | **Outcome Measures**Primary- Growth parameters (Wt, HC, length)Secondary- length of stay, NEC, IVH, BPD, ROP, LOS *(first 30 & 60 days postnatally)* | Slower Wt gain 1st 30 days in infants fed DHM compared to MOM No differences among groups in Wt gain at 60 daysNo differences among groups in HC or linear growth at DCNo signif between-group difference in severity & rate of NEC, IVH, BPD, & LOS  | Observation designDHM fed infants switched to PF (due to growth failure or as per protocol)*Sample powered to detect between-group differences in growth rate of 3.5 g/kg/d* | Higher growth velocity early in life with exclusive MOM feeding |
| **Montjaux-Regis et al.26****France***III C* | Prospective cohort Sample < 32wks GAN= 48 (3 cohorts)< 20% MOM, n=20 > 20 to < 80% MOM, n=11> 80% MOM, n=17 *Fortifier: bovine-based HMF* | **Outcome Measures** Growth parameters (Wt, length) Secondary- Feeding intolerance, NEC HCAIs *(birth to 32 wks or Wt at 1400g & DC* | Wt gain correlated with proportion of MOM intake> 80% MOM group gained Wt more rapidly than <20% MOMWt gain on average 5.1g/kg/d for infants receiving < 20% of MOMNo linear growth differences among groupsVariation in Wt gained explained by MOM %, feeding intolerance, & Wt 1st day of full feedingNo signif between-group differences in feeding intolerance, NEC or HCAIs | Observational designSmall sample MOM group supplemented with PF at 32 wks per protocol*Prospective data collection* | Wt gain correlated with % of MOM feeding |
| **Schanler et al.33****U.S.A.***I B* | RCT Sample < 30 wks GAN= 243 (3cohorts)Exclusive MOM, n=70DHM, n=81PF, n=92 *Fortifier: bovine-based HMF (up to 24 Kcal/oz)* | **Outcome Measures** LOS, NEC, length of stay & growth parameters (Wt, HC, length)*(birth to 90 days postnatally or DC)* | No between-group differences in Wt & HC. MOM group with significantly less linear growthDHM group with similar rates of LOS, NEC, length of stay & total infection-related events compared with PFLOS, NEC, & total infection-related events negatively correlated with quantity of MOM (r= -0.1 to -0.2; p< .02) | Proportion of feedings consisting of MOM vs. DHM not specified*Experimental study with large sample size* | As a substitute for MOM, DHM offered little short-term advantage over PFSocial differences contributed to feeding practices amongst MOM & DHM mothers |
| **Sisk et al.34****U.S.A.***III A* | Retrospective cohort Sample <32wks GA< 1500 g birthweightN= 551 (3 cohorts)>50% MOM, n=299>50% DHM, n=139>50% PF, n=113 *Fortifier: bovine-based HMF (up to 24 Kcal/oz)* | **Outcome Measures** NECSecondary- LOS, BPD, severe ROP, growth parameters (Wt, HC, length) (*birth to 34wks PMA)* | Risk of NEC was similar in MOM & DHM groupsNEC rates were significantly different by feeding group (MOM: 5.3%, DHM: 4.3%, PF: 11.4%; p = 0.04) No between group differences in other health outcomes or growth parameters at DC | Observational designUnable to compare exclusive MOM vs DHM feeding groups among one another*Very large sample size* | Exposure to 49% vs. 51% of any feeding type may not be sufficiently different to contribute to outcome differences between-groups |
| **Human milk feeding type on gut microbiome as primary outcome** |
| **Cong et al.36****U.S.A.***III B* | Prospective cohort  Sample < 32wks GAN= 33 419 stool samples6 feeding cohorts based on >70% of total frequency of feeding types in 10-day intervals (MOM, MOM+DHM, MOM+ PF, DHM, DHM+PF, PF)*Fortifier: bovine-based HMF* | **Outcome Measures**  gut microbiota*(birth to 30 days postnatally)* | MOM feeding associated with greater a**-**diversity of gut microbiome compared to other groups over three 10-days intervalsFeeding type significantly influenced microbial composition MOM fed associated with  Clostridiales, Bacillales, Lactobacillales, than DHM fed  Enterobacteriales in DHM fed than MOM | Observational design*Prospective data collection* | Even small quantities of MOM (supplemented with DHM) associated with more favorably microbial community |
| **Ford et al.30****U.S.***III B* | Prospective cohort Sample VLBW< 1500 g birthweightN= 117 (2 cohorts)546 stool samples > 50% MOM, n=74> 50% DHM, n=43*Fortifier: DHM-derived fortifier (up to <32 Kcal/oz)* | **Outcome Measures**  gut microbiota & growth parameters (Wt, length, HC)Secondary- feeding intolerance, NEC, LOS, BPD & death(*birth to 36 wks PMA or DC)* | Microbial diversity across all time points (n=546) combined in MOM (p< 0.0001)MOM fed with Bifidobacterium (p= 0.02) & Bacteroids (p= 0.04)DHM fed with Staphylococcus (p= 0.02)MOM fed with final weight (p< 0.01), length (p= 0.03), HC (p= 0.02), & growth velocity (p< 0.01) MOM fed showed 60% reduction in feeding intolerance (p= 0.03) compared to DHMDHM fed with composite score of severe morbidity (NEC, LOS, BPD or death) (p= 0.02 adjusted) | Observational design*Prospective data collection**Exclusive HM diet (including use of DHM-derived fortifier) allowed for direct comparison without confounding effects from PF or bovine-based fortifiers* | Microbial diversity remained higher across time in infants fed MOM |
| **Gregory et al.31****U.S.A.***III C* | Prospective cohort Sample < 32wks GAN= 30 (3 cohorts)100% MOM, n=10DHM, n=10PF, n=10*Unknown use of fortifier* | **Outcome Measures** gut microbiome (*birth to 32 wks PMA)* | Microbiome composition differed over time based on feeding type MOM associated with greater microbial diversity initially & over timeMOM & DHM feeding associated with an ordered succession of microbial phenotypes mostly Bacillales, Lactobacillales, followed by Enterobacteriales, Clostridiales & BifidobacterialesDHM feeding partially promotes in bacterial diversity similar to MOM | Observational designDHM infants switched to PF when full enteral feeding >140cc/kg/d*Prospective data collection* | MOM promotes intestinal health early in lifeDHM appears to mask the influence of birth Wt, suggesting a protective effect against gut immaturity |
| **Parra-Llorca et al.32****Spain***III B* | Prospective cohort Sample < 32wks GA< 1500 g birthweightN= 69 (3cohorts)> 80% MOM, n=34> 80% DHM, n=28> 80% PF, n=7 *Unknown use of fortifier* | **Outcome Measures**  gut microbiota *(Fecal samples evaluated when full enteral feedings achieved > 150cc/kg/d)* |  Microbiota diversity over time & remained higher in infants fed MOM (after controlling for covariates)Feeding type signif influenced microbial composition MOM fed associated with  Bifidobacteriaceae & Staphylococcaceae, Clostridiaceae, & Pasteurellaceae than DHM fed | Observational design*Prospective data collection* | Microbiota diversity increased over time & remained higher in infants fed MOM |

*Abbreviations:* NICU – Neonatal Intensive Care Unit; MOM –mother’s own milk; DHM – donor human milk; PF – Preterm formula; HM – human milk (includes both MOM & DM); PMA – postmenstrual age; SGA – small for gestational age; DC – NICU discharge; ­­LOS – late-onset sepsis; NEC – necrotizing enterocolitis; BPD – bronchopulmonary dysplasia; ROP – retinopathy of prematurity, IVH – intraventricular hemorrhage, HCAIs – healthcare acquired infections; Wt - weight, HC – head circumference