Conclusions DM supplement to MM supports growth in VLBWI without adversely affecting LowNa or NumNa.

Background and Aims A new additional protein supplement (Aptamil Protein+®/Milupa) was developed to meet special protein requirements of infants with a birthweight below 1000g (4.0–4.5 g protein/kg/day). So far it was unknown, how this new protein supplement influences osmolarity, which is known to be a risk factor for necrotising enterocolitis (NEC). The aim of this study was to evaluate the effects of fortification on the osmolarity of human milk (HM).

Methods Osmolarity of breast milk was measured in native HM, in HM+ HMF (human milk fortifier; Aptamil FMS 4.3%®, Milupa) and in HM+ HMF+ Protein+ gaining in 0.5 g steps up to 4 g. Measurements were performed immediately after adding on fortifier and/or protein and after 24 hours. In addition, changes in osmolarity after adding therapeutic additives like iron (Ferrum Hausmann®, Vifor), multivitamine supplement (Protovit®, Bayer) and calcium-phosphorus capsules were measured.

Results Osmolarity of native human milk (n=84) was 297mosm/l, (Median, Range 278–348). Adding HMF increased osmolarity up to 436mosm/l (Median, Range 366–486). Additional Protein+ supplement increased osmolarity by 23.5mosm/l (Median) per 0.5g step, up to a maximum of 605mosm/l (+4g). Osmolarity of HM/fortifier/Protein+ mixes remained stable for 24 hours. Multivitamin supplements increased osmolarity up to 842mosm/l.

Discussion Additional Protein+ increased osmolarity of HM up to a critical cut off point (>400mosmol) and therefore might be a risk factor for developing NEC. Additional fortification of HM +HMF with Protein+ should not be applied together with multivitamins or other additives.

Conclusions The institution of nutritional guidelines resulted in significant improvement in nutritional indicators in our population.