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The effect of dietary nucleotide supplementation on growth and immune function in term infants: a randomised controlled trial

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Introduction - Nucleotide (NT) supplemented infant formulas have been commercially available for a number of years despite the fact that clinical efficacy of NT supplementation has not been well established in randomised controlled trials.

Objective - Our aim was to assess the effect of NT-supplemented formula on infant growth and biochemical indices of immune function.

Design - This was a randomised controlled double blind trial of NT-supplementation in formula fed infants. Eligible infants were healthy, born at term and had a birth weight greater 2500g. Study outcome measures included lymphocyte subsets (CD4, CD8, NK), NK cell activity and cytokine production at 7 weeks of age, and plasma antibody concentrations of tetanus, diphtheria and haemophilus influenzae B at 7 months of age. Growth was assessed at 7 weeks, 4 and 7 months of age. An unblinded reference group of breastfed infants was also included.

Primary comparisons were made between the infants in the randomised groups. Secondary analyses included comparisons with breastfed infants.

Outcomes - 89/98 formula fed infants allocated to the NT-supplemented formula, 98/102 infants allocated to the control formula and 116/124 breastfed infants completed the trial to 7 months of age. Growth of NT-supplemented and control formula fed infants did not differ. There were no differences in the proportion or absolute number of lymphocyte subsets, NK cell activity, or cytokine production between any groups. IgG antibody concentrations to diphtheria (median 0.36 [0.09, 1.22] vs 0.27 [0.08, 1.65], n=138) and tetanus (median 1.57 [0.42, 3.43] vs 1.01 [0.41, 4.66], n=138) were higher in infants fed NT-supplemented formula compared with control infants. There were no differences between the formula fed groups and the breastfed group.

Conclusions - NT-supplementation of infant formula does not alter the growth of formula fed infants but may improve antibody responses to diphtheria and tetanus vaccines in comparison with control formula. The clinical significance of this change in plasma antibody concentrations is yet to be elucidated.

Food sources of sodium prior to and during the OZDASH study

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Objective - To assess the main food sources of sodium (Na) whilst on three different diets (OZDASH Study).

Design - The OZDASH diet (OD) was a moderate Na, high potassium (K), high calcium (Ca), low-fat diet. The high calcium diet (HC) was high in reduced-fat dairy products. The low Na, high K diet (LNAHK) was high in fruit and vegetables, low in salt and no-added-salt (NAS) bread was provided. Ninety-four participants completed OD, 48 HC and 43 LNAHK. An average of two 24-hr recalls at baseline (B) and during each 4-wk diet was used to estimate dietary Na intake. Foods were classified into 20 groups; the 4 groups providing most Na at B are shown in the table.

	B %	B (mg)	% Na and total daily Na (mg) from each food group					Na (mg)
			OD %	OD (mg)	HC %	HC (mg)	LNAHK%	
Breads/cereals	38	1093	39	822 †	33	960	21 ‡	233 ‡
Bread only	8	224	10	208	6	183	2 ‡	19 ‡
Meat products/dishes	17	479	9 ‡	180 ‡	16	467	15	170 ‡
Milk products/dishes	11	301	21 ‡	429 ‡	25 ‡	732 ‡	18 ‡	201 †
Sav sauce/condiments	9	264	7	152	6	178	5	57 ‡
Total Na (mg/d)		2864		2088 ‡		2913		1098 ‡

‡P<0.001 †P<0.01 compared to baseline

Outcomes - Breads/cereals provided the most Na both at B and on each diet, but the total Na provided reduced significantly from B to LNAHK by 30% (P<0.001) and OD by 9% (P<0.01). Only when NAS bread and low salt education was provided (LNAHK), did the amount of Na provided by bread alone fall significantly (7%, P<0.001).

Conclusion - Breads/cereals provide a large proportion of total dietary Na. Changing regular bread to NAS bread, and including low-sodium cereals/biscuits, can decrease total sodium intake by one-third.