Effects of fortified milk consumption on regional bone mineral accrual in Chinese girls

Q Zhang[1], GS Ma[2], H Greenfield[1], XQ Du[1], K Zhu[1], DR Fraser[1]

[1]*Faculty of Veterinary Science, University of Sydney, NSW, 2006*

[2]*Institute of Nutrition and Food Safety, Chinese Centre for Disease Control and Prevention, China*

Objective - To investigate the effect of supplementation with milk fortified with Ca and with/without vitamin D on regional bone mineral acquisition in Chinese girls.

Design - A 2-year double-blind controlled intervention trial with 757 girls, aged 10.1 ± 0.3 yr, randomised into three groups: Grp 1, 238 supplied with 330 ml Ca fortified milk per school day; Grp 2, 260 supplied with 330 ml Ca and vitamin D fortified milk per school day; Control Grp, 259. Regional bone mineral measures (from total body bone scan by dual-energy X-ray absorptiometry) were obtained in 375 (129, 121 and 125 in Grps 1, 2 and Control, respectively).

Outcomes - During the trial, subjects in Grps 1 and 2 were supplied on average with 144 ml milk daily containing 245 mg Ca with/without 3.3 μg vitamin D. After two years, compared with controls, supplemented groups had greater percentage increases in BMD of chest, pelvis (Grp 2 only), and legs (see table), and BMC of the latter two, but not BMD and BMC of arms.

	BMD			BMC		
	Grp 1	Grp 2	Control Grp	Grp 1	Grp 2	Control Grp
Chest	11.15 ± 0.89^{a}	12.08 ± 0.85^{a}	7.73 ± 1.02^{b}	17.72 ± 1.21^{a}	21.40 ± 1.53^{a}	35.21 ± 1.74^{b}
Pelvis	14.19 ± 1.10	15.14 ± 1.19^{a}	11.31 ± 1.00^{b}	35.42 ± 1.79^{a}	36.54 ± 2.32^{a}	27.13 ± 1.80^{b}
Left leg	5.52 ± 0.74^{a}	8.28 ± 0.70^{b}	1.38 ± 0.70^{c}	49.94 ± 1.23^{a}	48.84 ± 1.30^{a}	40.32 ± 1.04^{b}
Right leg	9.17 ± 0.78^{a}	10.41 ± 0.66^{a}	4.28 ± 0.76^{b}	46.15 ± 1.34^{a}	43.44 ± 1.36^{a}	35.27 ± 1.04^{b}

Values are mean ± SEM. Means within a row with different superscript letters are significantly different, $P<0.05$.

Conclusions - Ca and vitamin D fortified milk supplementation over two years resulted in greater bone mineral acquisition in weight-bearing positions in Chinese girls.