BREAST-MILK TRACE-ELEMENT CONCENTRATIONS : CHANGES WITH THE PROGRESSION OF LACTATION

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As part of a study of the effects of progestogen-only oral contraceptives on breast-milk composition, we have studied the changes in the trace-element concentrations in milk as lactation progresses. Previously, little has been known about trace elements in the milk of Australian women. A neutron activation analysis (NAA) technique developed by the CSIRO Division of Energy Chemistry, Lucas Heights Research Laboratories, allowed multi-element analysis on small samples of milk.

Early-morning fasting milk (10 mL) and blood (10 mL) samples were collected from 14 lactating women at 8, 16 and 23 weeks post-partum. The freeze-dried milk and plasma samples were analysed for zinc, copper and manganese by a radio-chemical separation NAA technique, and for iron, selenium, chromium, cobalt, rubidium and caesium by instrumental NAA.

Breast-milk trace-element concentrations (Mean ± SEM (n))

Element	Stage of lactation (weeks post-partum) 8	16	23
Copper (mg/kg)	0.5±0.1 (14)	0.4±0.1 (13)	0.3±0.1 (14)
Zinc (mg/kg)	2.1±0.2 (13)	1.6±0.2 (11)	1.1±0.1 (14)
Iron (mg/kg)	<0.5±0.1 (12)	0.9±0.2 (14)	0.4±0.1 (14)
Manganese (µg/kg)	5.1±0.9 (13)	5.1±0.9 (12)	4.5±0.5 (14)
Selenium (µg/kg)	12.3±1.0 (12)	12.5±0.8 (14)	11.0±0.6 (14)
Chromium (µg/kg)	<6.3±0.9 (10)	<6.1±0.9 (13)	<5.4±0.8 (11)
Cobalt (µg/kg)	0.2±0.1 (13)	0.2±0.0 (13)	0.3±0.2 (14)
Rubidium (mg/kg)	0.9±0.1 (4)	0.8±0.1 (5)	0.7±0.1 (5)
Caesium (µg/kg)	4.4±0.5 (13)	4.1±0.3 (14)	4.3±0.3 (14)

The milk concentrations of most of the trace elements declined with the progression of lactation. The oral contraceptives taken during the study period did not affect the milk trace-element concentrations.

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