

# Addendum: Challenging the Maligning of Homemade Human Milk Substitutes During a Shortage of Commercial Formula



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In Table 2 of the article “Challenging the Maligning of Homemade Human Milk Substitutes During a Shortage of Commercial Formula,” we analyzed nutrition based on the recommended energy intake per day<sup>1</sup> and received feedback post-publication

that analyzing by standard volume would be helpful to readers. For ease of analysis by volume, in this Addendum we compare an approximation of the nutritional profile of 100 mL of human milk<sup>2,3</sup> with the same quantity of a commercial substitute,<sup>4</sup> a homemade substitute, and the World Health Organization (WHO) emergency infant feeding recipe.<sup>5</sup> See Table 3 below. While feeding needs vary depending on an infant’s age and weight, for

**TABLE 3** Comparison of human milk, commercial formula, homemade substitute, and WHO emergency recipe by volume, with USDA RDI standards provided as a reference

	USDA RDI for 4.5 kg infant	Human milk (100 mL)	Commercial substitute (100 mL)	Homemade human milk substitute (100 mL)	WHO formula (100 mL)
Energy (kcal)	475	67.90	68.00	77.89	46.82
Millilitres required for 475 kcal	—	699.56	698.53	609.83	1,014.52
Protein (g)	9.10	1.00	1.35	2.10	2.20
% of total energy	—	5.89	7.94	10.65	18.80
Carbohydrate (g)	60.00	6.68	7.60	6.40	4.79
% of total energy	—	39.37	44.71	32.46	40.95
Fat (g)	31.00	4.25	3.60	5.03	2.15
% of total energy	—	56.31	47.65	58.10	41.29
<b>Minerals</b>					
Calcium (mg)	200.00	31.04	53.00	79.00	82.52
Phosphorus (mg)	100.00	13.58	29.00	65.46	67.65
Magnesium (mg)	30.00	2.91	54.00	51.74	8.06
Iron (mg)	0.27	0.03	1.22	1.19	0.00
Zinc (mg)	2.00	0.16	0.68	0.18	0.28
Manganese (mg)	0.00	0.00	0.01	0.00	0.00
Copper (mg)	0.20	0.05	0.05	0.03	0.00
Iodine (mg)	0.11	0.00	0.01	0.01	0.00
Selenium (mg)	0.02	0.002	0.002	0.001	0.001
Sodium (mg)	110.00	16.49	18.20	41.06	25.51
Potassium (mg)	400.00	49.47	73.00	201.45	100.68
Chloride (mg)	0.18	0.00	43.00	0.00	0.00

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TABLE 3 Cont'd.

	USDA RDI for 4.5 kg infant	Human milk (100 mL)	Commercial substitute (100 mL)	Homemade human milk substitute (100 mL)	WHO formula (100 mL)
<b>Vitamins</b>					
Vitamin A (mcg)	400.00	59.17	60.00	66.18	21.48
Vitamin D (mcg)	10.00	0.10	1.03	2.00	0.74
Vitamin E (mcg)	4000.00	77.60	904.5	833.33	33.55
Vitamin K (mcg)	0.00	0.29	6.10	0.29	0.20
Vitamin C (mg)	40.00	4.85	8.10	8.01	0.00
Thiamine (mg)	0.20	0.01	0.05	0.03	0.04
Riboflavin (mg)	0.30	0.03	0.10	0.08	0.09
Niacin (mg)	2.00	0.17	0.68	0.16	0.04
Pantothenic acid (mg)	1.70	0.18	0.34	0.07	0.10
Vitamin B6 (mg)	0.10	0.01	0.04	0.03	0.00
Folic acid (mcg)	65.00	4.85	10.80	39.23	0.00
Vitamin B12 (mcg)	0.4	0.05	0.20	0.041	0.36
Choline (mg)	125	15.52	16.20	9.42	11.94

WHO = World Health Organization; USDA = United States Department of Agriculture; RDI = recommended dietary intake.

context we have also noted the volume required for a 4.75 kg (10.47-lb) infant, which is the standard reference point for the United States Department of Agriculture recommended dietary intake (USDA RDI).<sup>1</sup> It is imperative to note that in order to meet this caloric target, an infant must ingest a 45% greater volume of the WHO emergency recipe than of human milk or a commercial substitute. Practically speaking, increasing the quantity that an infant ingests by this amount would be a near impossible task, arguing for a more nutritionally dense alternative. In comparison, this homemade substitute requires 13% less volume than human milk to achieve the same caloric goal, while also providing the vitamins and minerals essential for infant development (many of which are missing from the WHO formula). As was discussed previously, although there are some clear nutritional excesses that could pose risks in the long term, in emergency feeding situations where both human milk and commercial formula are unavailable, homemade substitutes such as the one analyzed here could provide a reasonably safe option for short-term use.

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