CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

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Agenda Item 5 **NFSDU/42 CRD 21**

JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX COMMITTEE ON NUTRITION AND FOODS FOR SPECIAL DIETARY USES

Forty-second Session

Virtual
19 - 25 November and 1 December 2021

PROPOSED DRAFT GUIDELINES FOR READY TO USE THERAPEUTIC FOODS (RUTF)

SUPPORT FOR A DOUBLING OF THE MAGNESIUM LEVELS IN RUTFs

Comments by National Health Federation

Respectfully submitted by the National Health Federation (NHF), a non-profit consumer organization, to the honorable Codex delegations at CAC44 for their consideration:

One of Codex's noble goals is to establish guidelines for healthy Ready-to-Use Therapeutic Foods (RUTFs), which are used to feed severely malnourished children (usually under the age of five). RUTFs are energy-dense, micronutrient-enriched pastes (similar in consistency to peanut butter) that are nutritionally similar to the traditional milk-based diet used in inpatient therapeutic feeding programs. Often, RUTFs consist of peanuts, oil, sugar, and milk powder. Some of the ingredients are not what we would consider healthy (certain oils and sugar) but the RUTFs do give an immediate sustenance to children who would otherwise die.

Codex observer-delegate UNICEF is a keen proponent of RUTFs and correctly states on its website that, "[p]roperly used, RUTF is safe, cost effective, and has saved hundreds of thousands of children's lives in recent years. Severe acute malnutrition is a major killer of children under five, accounting for approximately 1 million deaths annually. Around 20 million children worldwide are estimated to be suffering from this condition, of which only approximately 10-15 per cent currently receive treatment using RUTF." Codex wants to expand the availability of RUTFs by creating an internationally accepted guideline; and that is what is also being discussed at CAC and CCNFSDU meetings.

Of course, in the NHF's view and that of many other Codex delegations, the magnesium nutrient profile in RUTFs is much lower than what would provide children with optimal nutrition. Instead, it is only basic survival nutrition. We can do better for our children and should.

FAO/WHO Supports Higher Levels of Magnesium in Malnutrition Cases

The FAO/WHO expert consultation on vitamin and mineral requirements stated in its Chapter 14 on Magnesium that, "Susceptibility to the effects of magnesium deficiency rises when demands for magnesium increase markedly with the resumption of tissue growth ***during rehabilitation from general malnutrition*** (6, 13). Studies have shown that a decline in urinary magnesium excretion during protein-energy malnutrition (PEM) is accompanied by a reduced intestinal absorption of magnesium. ***The catch-up growth associated with recovery from PEM is achieved only if magnesium supply is increased substantially*** (6, 14)."[i]

In fact, the FAO/WHO Expert Consultation, in its published Table 46, makes the following recommendations:[ii]

"Recommended magnesium intakes are presented in Table 46 together with indications of the relationships of each recommendation to relevant estimates of the average requirements for dietary protein, and energy (19).

Table 46

Recommended nutrient intakes for magnesium (Mg) in milligrams (mg)

Age Group[a]	Assumed body weight kg[b]	RNI mg/day	Relative intake ratios Mg/kg	Mg/g protein	Mg/kcal/day
Infants and children					
0–6 months					
Human-milk fed	6	26		2.5	0.05
Formula fed	6	36	6.0	2.9	0.06
7–12 months	9	54	6.0	3.9	0.06
1–3 years	12	60	5.5	4.0	0.05
4–6 years	19	76	4.0	3.9	0.04
7–9 years	25	100	4.0	3.7	0.05
Adolescents, 10–18 years					
Females	49	220	4.5	5.2	0.10
Males	51	230	3.5	5.2	0.09
Adults, 19–65 years					
Females	55	220	4.0	4.8	0.10
Males	65	260	4.0	4.6	0.10
65+ years					
Females	54	190	3.5	4.1	0.10
Males	64	224	3.5	4.1	0.09

[a] No increment for pregnancy; 50 mg/day increment for lactation.
[b] Assumed body weights of age groups derived by interpolation (*57*).
[c] Intake per gram of recommended protein intake for age of subject (*21*).
[d] Intake per kilocalorie estimated average requirement (*21*).

The detailed studies of magnesium economy during malnutrition and subsequent therapy, with or without magnesium supplementation, provide reasonable grounds that the dietary magnesium recommendations derived herein for young children are realistic."

Looking at the FAO/WHO's Table 46 for the age groups from birth to age 9, the range of recommended nutrient intake for magnesium is – at the lowest – 26 milligrams per day for 0-6 months and then climbs dramatically up to 100 milligrams per day for 7-9 year-olds. ***Clearly, the current Codex recommendation of only 15 mgs/day badly shortchanges the magnesium nutrient requirements for those malnourished children who could benefit from a more-magnesium complete RUTF.***

And if one considers the United States Food and Drug Administration's Recommended Daily Allowance (RDA) for magnesium intake for children 1 to 3 years old at ***80 mg per day*** as well as for children 4 to 8 years old at ***130 mg per day***, the gap between the proposed Codex nutrient-intake level and recommended levels is even more severe.[iii]

Some researchers recommend 10 mg/kg/day for children because of their low body weight and increased requirements for growth.[iv] So, the proposed 15 mg/day Codex nutrient intake level for magnesium must be ***at the very least*** doubled in order for RUTFs to not suffer from mineral imbalance.

Calcium vs. Magnesium

We know that calcium and magnesium are twin minerals that operate within the body together. Neither can act at the biochemical level without eliciting a response from the other. Many enzymes whose activities critically depend on enough intracellular magnesium will be detrimentally affected by even small increases in levels of cellular calcium. Growth of cells, cell division, and intermediary metabolism are absolutely dependent upon the availability of magnesium, which can be compromised if excess calcium is present.[v]

All muscles (including the heart and blood vessels) contain more magnesium than calcium. If magnesium is deficient, then calcium floods the smooth muscle cells of the blood vessels and causes spasms leading to constricted blood vessels, which in turn leads to higher blood pressure, arterial spasm, angina, and heart attack. Maintaining a proper balance of magnesium and calcium can prevent these problems.[vi]

Our paleolithic ancestral diet – the ancient diet with which our bodies evolved – has been shown to have had a ratio of calcium-to-magnesium intake of 1:1. Unfortunately for modern human health, the dietary-intake ratio now ranges from 5:1 to 15:1.[vii]

With a high calcium-to-magnesium ratio of 3.7:1, the proposed Codex levels of calcium (55 mg) and magnesium (15 mg) need to be adjusted to provide optimal nutrition for malnourished children. In fact, the needs of the malnourished in this regard are even more critical than for those with adequate diets.

Conclusion

At the last in-person CCNFSDU meeting in November 2019, NHF expressed its concern to the Committee over the high ratio of calcium to magnesium (55 mg to 15 mg) as well as over the generally low minimum and maximum levels being set for magnesium, reminding everyone that extensive science supporting higher levels exists and had been previously submitted to the Committee.

This view was supported by the International Ready to Use Foods Association, and its spokesman, Dr. Mark J. Manary, M.D., as well as by the delegation of the United States. NHF also notes and appreciates the support at this meeting of the delegations of Egypt, Iran, and Thailand, as well as the continued support of the USA.

We therefore respectfully implore the honorable Codex Alimentarius delegations that the proposed RUTF levels for magnesium be doubled (or more) to be closer to the proposed values for calcium and to be in line with FAO/WHO and U.S. recommended levels of magnesium intake. (In the alternative, an RUTF range of 15 mg to 45 mg of magnesium is acceptable.) Most importantly of all, increased intake of magnesium will lead to healthier children who consume RUTFs.

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[i] *See* file:///C:/Users/Stars/Documents/Codex%20Alimentarius/Codex%20NRVs%202013/FAO-WHO%20Report%20on%20Magnesium%202002.pdf. *See, e.g.,* Waterlow JC, 1992, *Protein Energy Malnutrition*, London, Edwin Arnold; and Nichols BL, Alvarado J, Hazelwood CF & Viteri F, 1978, "Magnesium supplement in protein-calorie malnutrition," *Am. J. Clin. Nutr.*, 31: 176-188.

[ii] *See* file:///C:/Users/Stars/Documents/Codex%20Alimentarius/Codex%20NRVs%202013/FAO-WHO%20Report%20on%20Magnesium%202002.pdf. *See also*, Tan SP, Wenlock RW & Buss DH, 1985, *Immigrant Foods: 2nd Suppt to the Composition of Foods*, London. HMSO.

[iii] Dr. Carolyn Dean, M.D., *The Miracle of Magnesium*, Ballantine Books, 2003, at page 207.

[iv] Durlach J, *Magnesium in Clinical Practice*, Libbey, London, 1988; Ducroix T, "L'Enfant spasmophile – Aspects diagnostiques et therapeutiques," *Magnes Bull*, Vol. 1, pp. 9-15, 1984. *See also* Dr. Carolyn Dean, M.D., *The Miracle of Magnesium*, Ballantine Books, 2003, at page 225.

[v] Walker GM, "Biotechnological implications of the interactions between magnesium and calcium," Magnes Res., Vol. 12, No. 4, pp. 303-309 (1999).

[vi] Dr. Carolyn Dean, M.D., *The Miracle of Magnesium*, Ballantine Books, 2003, at pages 27-28. *See also* Altura BM, "Sudden-death ischemic heart disease and dietary magnesium intake: is the target site coronary vascular smooth muscle?" *Med Hypotheses*, Vol. 8, pp.843-848 (1999).

[vii] Eades M & Eades A, *The Protein Power Lifeplan*, Warner Books, New York (1999).