Editorial

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New health benefits of dairy products[1,2]

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In this issue of the Journal, Choi et al. (1) add a new twist to the ongoing controversy concerning the health benefits of dairy consumption by showing a positive relation between the numbers of dairy servings consumed daily and brain concentrations of glutathione (GSH). In a group of older, healthy individuals preselected to cover a wide range of dairy intakes, GSH concentrations were shown to correlate directly with intake of milk and calcium but not cheese or yogurt. The study takes advantage of a novel magnetic resonance technique for assessing GSH concentrations in 3 regions of the brain and builds on preliminary data obtained by this group in earlier research. The article gives a major boost to dairy consumption, because GSH concentrations and antioxidant status overall are of particular concern in the context of considerable data showing linkages between poor oxidative status and degenerative disease.

So, do we conclude that dairy consumption ought to be further encouraged in the elderly? Certainly from the standpoint of calcium and high-quality protein perspectives, adding more milk to the diets of older individuals ought to be advocated. However, before pushing milk from the standpoint of contributing to an antioxidant effect, the study design needs to be reviewed and examined and certain features noted.

First, the study used a cross-sectional design, in which subjects were recruited deliberately on the basis of their self-reported dietary patterns to fall into low, medium, and recommended categories of calcium intake. Although such a design is common, it falls short of the rigor of a controlled randomized controlled trial (RCT) intervention design, in which groups of similar individuals are allocated to various intake amounts of milk, consumed under the watchful eye of study coordinators, with GSH concentrations then measured in the brain after an appropriate period of intervention. The RCT design, although more robust, also has limitations, such as often involving shorter periods of exposure; however, the design does ensure that the effect on GSH concentration is not falsely attributed to some other lifestyle or dietary factor not accounted for in the statistical model of the study.

For instance, the high-dairy consumers may have had other lifestyle or environmental factors that result in heightened concentrations of antioxidants compared with those who consumed less milk. It has been shown that diet quality associates with social class (2) as well as educational status, where higher levels of schooling are linked to greater consumption of milk (3). Thus, healthier environments and more prudent lifestyle choices, such as lower smoking behavior, may contribute to improved antioxidant status, independent of milk consumption. Along these lines, data from the article do hint at cross-group differences in that fat-free mass was greater in the individuals who consumed the highest amount of dairy, as were intakes of key macronutrients (1).

Second, the dietary data were collected by a self-reporting assessment instrument. As the authors point out, limitations exist in the fidelity of these tools to accurately portray true intakes. However, an expert group working in this area reached the consensus that dietary intake assessment by using self-reporting approaches is so basically flawed that it should not be relied on as a means of depicting dietary intake (4). The group underscores the difficulty in identifying who among a group underreports and who does not, and for what nutrients. Accordingly, it cannot be ruled out that those in the high-dairy-intake group accurately reported that category of foods but may have inaccurately reported another category that influenced oxidative status—thus, GSH concentrations.

What about the mechanism underpinning the diet-disorder relation in this article? The authors do offer some interesting possible biochemical explanations as to why the effects were observed. The calcium and riboflavin hypotheses sound plausible, although the latter vitamin is typically found in several foods over and above milk. The idea that concentrations of cysteine, an important precursor in the synthesis of GSH, were increased by the protein fraction in milk drinkers is a plausible theory, which could have been tested by examination of concentrations in blood across the 3 study groups. Again, a well-designed RCT is needed to ascertain whether cysteine provided at the amounts supplied in milk would both increase circulating concentrations as well as augment GSH concentrations in brain.

Last, it was curious that, although the relation of brain GSH was strongest with the degree of milk consumption, this relation was not observed with the intake of other forms of dairy such as cheese or yogurt. Given that these latter foods also contain a profile of vitamins, minerals, and protein similar to milk, it leaves

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one speculating whether the lactose present in milk could possibly be at least in part responsible through some action on the gut microbiome, as reported in younger individuals (5). A study of gut flora patterns in older individuals consuming different amounts and types of dairy products, and the links to brain GSH concentrations, would address this issue.

In conclusion, the present study presents a provocative new benefit of the consumption of milk in older individuals and serves as a starting point for further exploration as to the size and the etiology of the effect. Such work is required to properly position the role of milk and dairy products in the promotion of wellness from a public health perspective.

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