

who reported diarrhea increased with increasing dose of olestra (*i.e.*, 3 subjects (20 percent) in the placebo, 6 subjects (40 percent) who consumed 10 g of olestra, and 11 subjects (69 percent) who consumed 20 g of olestra). In addition, both the mean number of reported diarrheal bowel movements per subject reporting any diarrhea, and the severity of the reported diarrhea, increased with increasing olestra consumption. Although there was an increase in the number of subjects reporting loose stools with increasing olestra dose, this increase was not statistically significant. FDA concluded that these results were qualitatively similar to the results of the 8-week studies.

The agency concluded, based upon its evaluation of the data and information available at the time, that consumption of olestra causes GI effects such as loose stools, abdominal cramping, and diarrhea-like symptoms. Additionally, the agency concluded that while olestra caused these GI symptoms, there was no evidence that these effects represented adverse health consequences.

At the time of approval, the agency did not have information about the potential GI effects from usual or customary consumption of olestra in savory snacks. Nonetheless, FDA considered it prudent to rely on the available data in deciding whether a label statement about olestra's potential effects on the GI tract was necessary. Olestra had the potential to be consumed in relatively large quantities by every segment of the U.S. population. Additionally, because olestra had never before been available in the marketplace, consumers had no experience with it and were not familiar with it or its potential to cause GI effects. The agency believed that providing consumers label information about olestra's GI effects would preclude unnecessary concerns about the origin of GI effects, were they to be observed, and might also prevent unnecessary or inappropriate medical treatment of those symptoms (61 FR 3118 at 3161). Based on the weight of the evidence about olestra's potential to cause GI effects, as well as the agency's belief that consumers lacked familiarity with olestra and its potential to cause such effects, FDA concluded at the time of olestra's approval that the relationship between GI symptoms and consumption of foods containing olestra is a fact that is material in light of the consequences of consuming olestra, and therefore a label statement was required.

3. Nutritional Issues Associated With Olestra

FDA concluded that olestra inhibits the absorption of the fat-soluble components of the diet when these components are present in the GI tract simultaneously with olestra (61 FR 3118 at 3132–3147). Such components include the fat-soluble vitamins A, D, E, and K, and the lipophilic carotenoids. Based on the data from the nutritional studies, FDA concluded that addition of the four fat-soluble vitamins (A, D, E, K) to foods containing olestra would compensate for any decreased absorption due to the action of olestra, thus ensuring that consumption of an olestra-containing food would not alter the amount of vitamin available for absorption (61 FR 3118 at 3144–3147). The amounts of the vitamins to be provided are prescribed to ensure safe use (§ 172.867(d)). As required under section 403(i) of the act, these vitamins are declared in the ingredient listing.

The added vitamins were not to be considered in determining nutrient content of the food for the nutritional label or for any nutrient claims, expressed or implied. This is because the added vitamins simply compensate for the transient impaired absorption of vitamins A, D, E, and K, *i.e.*, they are added to ensure no change (neither increase nor decrease) in vitamin availability. Thus, the vitamins added to olestra do not contribute significant amounts of these nutrients to the diet (61 FR 3118 at 3161).

Labeling may be considered misleading not only if it fails to reveal facts that are material in light of consequences that may result from use of a food, but also if the labeling fails to reveal facts that are material in light of representations made. Therefore, to set the context for why vitamins A, D, E, and K were added, FDA required a label statement providing information both that vitamins A, D, E, and K had been added and that olestra inhibits the absorption of vitamins. Because FDA believed that consumers who see vitamins A, D, E, and K in the ingredient listing might incorrectly believe that the food was fortified with these vitamins, the agency required an explanatory statement on the label of olestra-containing foods to inform consumers that olestra-containing foods were not an enhanced source of vitamins A, D, E, and K. The statement indicated that olestra inhibits the absorption of vitamins and other nutrients to explain why they were added. FDA included the term "other nutrients" because any nutrient that is as lipophilic as these vitamins would

also be affected, although FDA concluded that there was no basis for adding back nutrients other than vitamins A, D, E, and K. In this way, FDA sought to make clear to consumers the reason for the presence of vitamins A, D, E, and K in the ingredient listing.

Carotenoids are fat-soluble components in the diet, the majority of which are derived from fruits and vegetables. Data from the petitioner's two 8-week studies demonstrated that consumption of olestra inhibits absorption of carotenoids as measured by a decrease in serum carotenoid levels (61 FR 3118 at 3147–3149). Co-consumption of olestra and a carotenoid-containing food allows the greatest interaction between olestra and the carotenoid, thereby maximizing the potential for interfering with absorption of the carotenoid from the GI tract.

Beta-carotene is a provitamin A carotenoid that is a dietary source of vitamin A; provitamin A carotenoids are converted in the body into vitamin A. At the time of the 1996 final rule, FDA concluded that supplementing olestra-containing foods with vitamin A would compensate for olestra's effects on the provitamin A function of carotenoids.

In evaluating whether there is a scientific basis to require the addition of any carotenoids to olestra-containing foods, FDA consulted with scientists at the National Cancer Institute of the National Institutes of Health (NIH) and the National Eye Institute (NEI) of the NIH (61 FR 3118 at 3148–3149), and the agency's Food Advisory Committee (FAC) (61 FR 3118 at 3121). At the 1995 FAC meeting on olestra, experts with a range of views discussed whether carotenoids themselves have beneficial health effects, or whether it is some other substance in fruits and vegetables that provides the claimed health effects, in which case the carotenoids are serving solely as markers for fruit and vegetable consumption. Five different conferences or reviewing groups preceding the 1995 FAC meeting had examined the relationship between carotenoids and disease. All of these groups had concluded that there was insufficient evidence to recommend consumption of carotenoids, except to encourage the consumption of fruits and vegetables (61 FR 3118 at 3148). Although epidemiological studies showed an association between diets rich in fruits and vegetables (including those that contain carotenoids) and decreased cancer risk, there was no direct evidence that carotenoids themselves were responsible for or contributed in a significant way to that protective benefit. Therefore, at the time of the approval of olestra, the agency