

Authors' Financial Relationships With the Food and Beverage Industry and Their Published Positions on the Fat Substitute Olestra

Jane Levine, EdD, Joan Dye Gussow, EdD, Diane Hastings, EdD, and Amy Eccher, MS

The Procter and Gamble (P&G) indigestible fat substitute olestra was approved as a food additive by the Food and Drug Administration (FDA) in 1996 with the proviso that olestra-containing products carry a warning statement about the additive's potential negative effects on gastrointestinal function and nutrient absorption.¹ Since that time, concerns about laxative effects and nutrient depletion have continued to be debated in the medical and nutrition literature and in the lay press.²⁻⁵

P&G conducted an extensive marketing campaign for olestra, both before and after approval. The campaign included financial support of health professionals through "research grants, travel funds, honoraria, educational materials, samples, and meals."⁶ Industry support of health professionals is controversial because such relationships may pose a conflict of interest. For example, physicians' financial relationships with the pharmaceutical industry have been shown to be associated with their positions on the safety of calcium-channel antagonists.⁷ Other studies examining potential conflicts of interest related to pharmaceutical industry support have demonstrated similar results.⁸⁻¹⁰

Although a single study examines what nutrition professionals know and think about the food industry's marketing efforts in elementary schools,¹¹ the extent to which support by the food and beverage industry influences the opinions and behavior of health professionals appears not to have been studied. The debate about the safety and efficacy of olestra in assisting with weight loss provides such an opportunity. We designed our study after that of Stelfox et al.⁷ to examine whether authors' financial interactions with the food and beverage industry are related to their published positions regarding olestra.

Objectives. This study examined the association between authors' published positions on the safety and efficacy in assisting with weight loss of the Procter & Gamble (P&G) fat substitute olestra and their financial relationships with the food and beverage industry.

Methods. Journal articles about olestra, and their authors, were classified as supportive, critical, or neutral with respect to its use. Authors not known to have industry affiliations were surveyed about their financial relationships.

Results. Supportive authors were significantly more likely than critical or neutral authors to have financial relationships with P&G (80% vs 11% and 21%, respectively; $P < .0001$). All authors disclosing an affiliation with P&G were supportive.

Conclusions. Because authors' published opinions were associated with their financial relationships, obtaining noncommercial funding may be more essential to maintaining objectivity than disclosing personal financial interests. (*Am J Public Health.* 2003; 93:664-669)

METHODS

Study Questions

We asked 2 questions: (1) Are authors who support or whose research findings support the use of olestra more likely than neutral or critical authors to have financial relationships with P&G? (2) Are authors who support the use of olestra more likely than neutral or critical authors to have financial relationships with *any* food or beverage company or trade group? To answer these questions, we examined authors' financial relationships with P&G and with other food and beverage companies and trade groups and compared them with their published positions.

Selection and Review of Articles

We identified authors by reviewing materials on olestra written by health professionals and published between 1996 (the year olestra was approved by the FDA) and September 1999. Relevant materials (reports and reviews of original research, commentaries, editorials, and letters to the editor) were identified using the MEDLINE database and the indexes of the journals of the American Dietetic Association and the Society for Nutrition Education (the major applied-nutrition

journals). Of the 72 articles identified, only 67^{2-4,7,12-74} were included in the study, because it was later determined that 5 articles⁷⁵⁻⁷⁹ did not concern the safety and efficacy of olestra.

The articles were reviewed and classified as supportive, neutral, or critical with respect to the use of olestra by criteria defined as follows:

Supportive: Emphasizes safety/efficacy; recommends use; criticizes authors questioning safety/efficacy.

Neutral: Concludes that there is insufficient information to assess safety/efficacy; makes no recommendations about use; equitably assesses opposing views.

Critical: Emphasizes concerns about safety/efficacy; recommends alternatives; criticizes authors emphasizing safety/efficacy.

The articles were first assessed by 2 raters independently (J.L. and J.G.), 1 of whom did and 1 of whom did not make a conscious effort to ignore authors' stated affiliations. When the independent rankings of the first 2 raters were compared, there were 19 discrepancies (for only 1 article the difference was supportive vs critical; for 2 it was supportive vs neutral, and in the 16 remaining cases, one of the reviewers rated the article

either supportive or critical and the other was undecided between the same rating and neutral). All but 4 of these minor discrepancies were resolved by having both raters reread the articles. The articles then were submitted to a third rater (D.H.) who had no prior contact with either the articles or the other raters' ratings. The articles were sent to this rater with all indications of authors' affiliations removed. In the undisputed cases, the latter ratings agreed with the original 2 raters in all but 5 cases; in those cases, the original ratings were determinant. In the 4 originally disputed cases, the third rater agreed with one or the other of the original raters, and her ratings were accepted as final.

Each author was assigned a classification based on the classification of the article. Authors of more than 1 article were assigned a single classification. Authors classified as neutral on the basis of 1 article but as supportive or critical on the basis of another were classified as supportive or critical, respectively. No author was found to be supportive in 1 article and critical in another.

Survey Instrument

A survey instrument based on the questionnaire of Stelfox et al.⁷ was developed to examine the authors' financial relationships with food and beverage companies and trade groups. The questionnaire was sent to the authors of all the identified articles, excepting those whose mailing address was a food company or industry group. Authors whose food industry affiliations were known were not surveyed, because their financial relationship was obvious. Major food and beverage companies and trade groups, many of which were known to have previous or ongoing financial relationships with health professionals, were listed alphabetically on the questionnaire. For each of the organizations listed, authors were asked whether they had received any of 5 types of funding in the past 6 years: (1) a scholarship or research grant, (2) travel expenses to attend a conference, (3) an honorarium to speak at a conference, (4) support to organize an educational program, or (5) employment or consultation. The authors were also asked whether they had equity in any of the companies.

The addresses of as many authors as possible were obtained from the articles. For the addresses that could not be so obtained, a search was made for recent articles by the same author that might carry an address, and various Web sites were searched. The names of authors with missing addresses were also submitted to a colleague with experience in such searches for long-term epidemiological studies. If all else failed, questionnaires for coauthors were sent to first authors on the same study with a request to forward. The survey questionnaire was mailed to 102 authors with a cover letter explaining the purpose of the study.

Statistical Analysis

The rate of response to the survey was analyzed according to the authors' ratings (supportive, neutral, or critical). Responses were coded according to the indication of at least 1 relationship with P&G or with any food and beverage company or trade group. The data analysis included the survey respondents and the authors who were not sent a questionnaire because of a known food industry affiliation. Logistic regression was used to determine whether a significant relationship existed between an author's rating and the presence of financial support. The results are reported as χ^2 values and *P* values. A series of logistic regressions was also performed for each type of financial support. In addition, χ^2 and Spearman's *r* analyses were performed to examine whether a significant relationship existed between a survey respondent's rating and the number of financial interactions reported.

RESULTS

Classification of Authors

The study included 67 articles (35 reports of original research, 7 review articles, 17 commentaries/editorials, and 8 letters to the editor) (Table 1). Thirty-eight (57%) were classified as supportive,^{3,12-48} 16 (24%) as neutral,^{2,49-63} and 13 (19%) as critical.^{4,7,64-74} Thirty-five (52%) of the 67 articles carried acknowledgments of P&G support or identified at least 1 author as affiliated with P&G. Of these, 83% were classified as supportive, 17% as neutral, and none as critical.

From 67 articles, we identified 148 authors. Each author was assigned a classification based on that of his or her articles; 101 were classified as supportive, 22 as neutral, and 25 as critical. Of the 102 authors surveyed, 58 were classified as supportive, 21 as neutral, and 23 as critical. Of the authors who were not sent a questionnaire because of a food industry mailing address, all 40 authors affiliated with P&G were classified as supportive; 3 of the 5 authors with other food industry affiliations were classified as supportive, and 2 were classified as critical. A mailing address could not be obtained for 1 author classified as neutral.

Response Rates for the Survey

Questionnaires were sent to the 102 authors included in the study who had non-food industry mailing addresses. Twelve questionnaires were "returned to sender" because of noncurrent addresses, and 1 author was deceased. Sixty-three (71%) of the remaining 89 authors responded; of these, 1 classified as supportive did not complete the questionnaire. A total of 62 authors (70%) completed the survey. This percentage was consistent across all 3 classifications. That is, 32 (70%) of the 46 respondents supportive of olestra completed the survey, as did 14 (70%) of the 20 neutral authors and 16 (70%) of the 23 critical authors. The consistency of the response rates suggests that nonresponses are highly unlikely to have altered the results. The final sample consisted of 107 authors (62 survey respondents and the 45 with food industry mailing addresses who were not sent the survey).

Study Questions

Our first question—whether authors who supported the use of olestra were more likely than neutral or critical authors to have financial relationships with P&G—was answered affirmatively. Eighty percent of the supportive authors had at least 1 financial interaction with P&G, compared with 21% of neutral authors and 11% of critical authors (Table 2).

The second question was whether authors who supported olestra were more likely than neutral or critical authors to have financial relationships with any food and beverage company or trade group. The answer was, once

TABLE 1—Analysis of Articles by Type of Article, 1996–1999

Type of Article	No. of Articles (%)			
	Total	Supportive	Neutral	Critical
Research				
P&G ^a	25	19 (76)	6 (24)	0 (0)
Other ^b	7	3 (43)	3 (43)	1 (14)
No industry ^c	3	2 (67)	1 (33)	0 (0)
Total	35	24 (69)	10 (29)	1 (3)
Review				
P&G ^a	6	6 (100)	0 (0)	0 (0)
Other ^b	0	0 (0)	0 (0)	0 (0)
No industry ^c	1	0 (0)	1 (100)	0 (0)
Total	7	6 (86)	1 (14)	0 (0)
Commentary				
P&G ^a	3	3 (100)	0 (0)	0 (0)
Other ^b	1	0 (0)	0 (0)	1 (100)
No industry ^c	13	2 (15)	5 (38)	6 (46)
Total	17	5 (29)	5 (29)	7 (41)
Letter				
P&G ^a	1	1 (100)	0 (0)	0 (0)
Other ^b	0	0 (0)	0 (0)	0 (0)
No industry ^c	7	2 (29)	0 (0)	5 (71)
Total	8	3 (38)	0 (0)	5 (62)
Total				
P&G ^a	35	29 (83)	6 (17)	0 (0)
Other ^b	8	3 (38)	3 (38)	2 (25)
No industry ^c	24	6 (25)	7 (29)	11 (46)
Total	67	38 (57)	16 (24)	13 (19)

Note. P&G = Proctor & Gamble.

^aArticles with at least 1 P&G author or acknowledged P&G support.

^bArticles with at least 1 non-P&G food industry author or acknowledged non-P&G food industry support.

^cArticles with no acknowledged food industry authors or support.

TABLE 2—Authors With Financial Relationships With the Food and Beverage Industry, 1996–1999

	No. of Authors (%)				χ^2
	Total (n = 107)	Supportive (n = 75)	Neutral (n = 14)	Critical (n = 18)	
No food industry	20	3 (4)	7 (50)	10 (56)	28.7*
P&G	65	60 (80)	3 (21)	2 (11)	39.6*
Any food industry	87	72 (96)	7 (50)	8 (44)	28.7*

Note. Includes survey respondents and authors with known food industry affiliations (n = 107). P&G = Proctor & Gamble.

* $P < .0001$.

again, yes. Ninety-six percent of the supportive respondents, compared with 50% of neutral authors and 44% of critical authors, had financial relationships with at least 1 member of the food and beverage industry (Table 2).

Associations between the authors' published positions on the safety and efficacy of olestra and their financial relationships with the food and beverage industry were analyzed across 6 categories of funding (Table 3).

A clear, consistent association was found on 3 of the 6 categories—honoraria for speeches, research grants, and employment or consultation. The association was strongest for research grants and employment or consultation. All 40 authors who were listed on the articles as affiliated with P&G were classified as supportive.

The number of financial interactions with the food and beverage industry, which could be assessed only for survey respondents, was significantly associated with authors' positions on the safety and efficacy of olestra (Spearman's $r = .43$, $P = .001$); respondents classified as supportive reported the greatest number of financial interactions (Table 4). In addition, 50% of the supportive respondents reported 2 or more of the 6 types of interactions, compared with 14% of the neutral respondents and 12% of the critical respondents.

DISCUSSION

Food and beverage companies and trade groups employ nutrition researchers. The industry also sponsors the research of nutrition investigators, and nutrition academics consult for food companies.⁸⁰ The extent to which such widespread financial support influences research results and opinions has not been investigated. Our study, which examined the relationship between food and beverage industry funding and health professionals' conclusions about P&G's fat substitute olestra, was undertaken to begin to fill that gap. The findings demonstrate a strong association between authors' published opinions about the safety and efficacy of olestra and their financial relationships with the food and beverage industry. Supportive authors were much more likely than critical authors to have financial relationships with P&G and were also more likely to have financial relationships with any food and beverage company or trade group. These findings are similar to those of Stelfox et al.⁷ The types of support that appear to be most influential are research funding and employment or consultation.

In 2001, a major study⁸¹ concluded that nondisclosure of personal financial interests is a significant problem in scientific and medical literature. However, nondisclosure is not at the heart of the problem identified in our

TABLE 3—Authors' Financial Relationships With the Food and Beverage Industry, by Type of Support, 1996–1999

Type of Funding	No. of Authors (%)			χ^2 (P)
	Supportive (n = 32)	Neutral (n = 14)	Critical (n = 16)	
Travel funding ^a				
P&G	2 (6)	0 (0)	2 (13)	0.63 (P = .43)
Any food industry	7 (22)	1 (7)	3 (19)	5.1 (P = .02)
Speaker funding ^a				
P&G	3 (9)	0 (0)	0 (0)	9.5 (P = .002)
Any food industry	8 (25)	1 (7)	1 (6)	11.4 (P = .0007)
Education funding ^a				
P&G	1 (3)	0 (0)	0 (0)	3.5 (P = .06)
Any food industry	2 (6)	0 (0)	1 (6)	1.9 (P = .17)
Research funding ^a				
P&G	15 (47)	1 (7)	0 (0)	27.1 (P < .0001)
Any food industry	22 (69)	5 (36)	4 (25)	15.4 (P = .0001)
Equity ^a				
P&G	1 (3)	1 (7)	0 (0)	0.22 (P = .64)
Any food industry	3 (9)	1 (7)	0 (0)	7.0 (P = .008)
Employment or consultation ^b	(n = 75)	(n = 14)	(n = 18)	
P&G	44 (59)	1 (7)	1 (6)	42.5 (P < .0001)
Any food industry	55 (73)	3 (21)	5 (28)	30.2 (P < .0001)

Note. P&G = Proctor & Gamble.

^aIncludes only survey respondents (n = 62).

^bIncludes survey respondents and authors with known food and beverage industry affiliations (n = 107).

TABLE 4—Number of Financial Interactions Reported by Survey Respondents, 1996–1999 (n = 62)

No. of Financial Interactions	Supportive	Neutral	Critical
0	3	7	10
1	11	2	2
2	7	3	2
≥ 3	11	2	2

Note. $\chi^2 = 17.3$ (P = .008); Spearman's $r = .42$ (P = .001).

study. In the case of olestra, P&G openly sponsored an entire issue of *The Journal of Nutrition* devoted to olestra studies authored by P&G scientists.^{30–41} The food industry's open support of nutrition scientists goes as far back as 1918, when the National Dairy Council began enlisting the support of nutrition researchers such as E. V. McCollum of Johns Hopkins University and H. C. Sherman of Co-

lumbia University.⁸² No conflict of interest was found at the time, because milk was considered a basic food that nutritionists would be recommending anyway. The possibility for such conflict is more obvious when research support involves products such as sugared breakfast cereals and olestra, whose use is more controversial.

One critic⁸⁰ believes that a "just say no" approach to such financial relationships is unlikely to be used and that a "pragmatic compromise" would include balancing risks and benefits and disclosing all sponsorship relationships. That approach is similar to the one recommended by Stelfox et al.,⁷ who described a process for disclosing conflicts of interest. What our study suggests, however, is that disclosure of conflicts of interest does little more than warn the reader and that non-commercial funding sources are essential. Eighty-three percent of the articles that acknowledged P&G support or a P&G-affiliated author were classified as supportive, and none were classified as critical. Forty authors

disclosed their affiliation with P&G, and all 40 were supportive of olestra. Because the regulation of food products is the responsibility of the FDA, which neither funds nor conducts research relating to those products, it seems unlikely that the balance of available research funding will change in the near future. In such an environment, journal readers seeking to answer questions about the safety and usefulness of food products need to exercise exceptional caution.

Limitations of the Study

Authors who disclosed their food industry affiliations (most were employed by P&G) were not sent questionnaires, so their other financial relationships could not be determined. In addition, this study cannot rule out the possibility that the causality of the relationship implied by the results—that authors' opinions were influenced by their financial relationships with the industry—is not reversed. Food and beverage companies may well seek out relationships with researchers and practitioners whom they know to be supportive of their products. ■

About the Authors

Jane Levine is with *Kids Can Make A Difference*, Kittery Point, Me. Joan Dye Gussow is with the Department of Health and Behavior Studies, Teachers College, Columbia University, New York, NY. Diane Hastings is an independent nutrition consultant in Potomac, Md. Amy Echer is an independent statistical consultant in Aurora, Ill.

Requests for reprints should be sent to Jane Levine, EdD, *Kids Can Make A Difference*, PO Box 54, Kittery Point, ME 03905 (e-mail: jane.levine@attbi.com).

This article was accepted August 21, 2002.

Contributors

J. Levine conceived the study, contributed to its design, was responsible for data acquisition, and did most of the article preparation. J.D. Gussow contributed to the design of the study and article preparation. All authors contributed to the analysis and interpretation of the data and critical revision of the article; D. Hastings focused on analyzing and rating the articles; A. Echer did the statistical analyses.

Acknowledgments

This study was funded by J. Levine and J.D. Gussow. J. Levine, J.D. Gussow, and D. Hastings have no financial relationships with the food and beverage industry. A. Echer has provided statistical expertise on market research studies for food companies.

Human Participant Protection

The study was approved by the institutional review board for the protection of human subjects in research

at Teachers College, Columbia University (IRB 010-032).

References

1. Food and Drug Administration. FDA approves fat substitute, olestra [press release]. *HHS News*. January 24, 1996.
2. Spiro HM. Fat, foreboding, and flatulence. *Ann Intern Med*. 1999;130:320-322.
3. Thomson ABR, Hunt RH, Zorich NL. Review article: olestra and its gastrointestinal safety. *Aliment Pharmacol Ther*. 1998;12:1185-1200.
4. Jacobson MF, Brown MA, Whorton EB Jr. Gastrointestinal symptoms following olestra consumption [letter]. *JAMA*. 1998;280:325-327.
5. Burros M. Selling olestra despite experts' doubts. *New York Times*. February 25, 1998:C2.
6. Nestle M. The selling of olestra. *Public Health*. 1998;113:508-520.
7. Stelfox HT, Chua G, O'Rourke K, Detsky AS. Conflict of interest in the debate over calcium-channel antagonists. *N Engl J Med*. 1998;338:101-106.
8. Friedberg M, Saffran B, Stinson TJ, Nelson W, Bennett CL. Evaluation of conflict of interest in economic analyses of new drugs used in oncology. *JAMA*. 1999;282:1453-1457.
9. Cho MK, Bero LA. The quality of drug studies published in symposium proceedings. *Ann Intern Med*. 1996;124:485-489.
10. Chren MM, Landefeld CS. Physicians' behavior and their interactions with drug companies. *JAMA*. 1994;271:684-689.
11. Levine J, Gussow JD. Nutrition professionals' knowledge of and attitudes toward the food industry's education and marketing programs in elementary schools. *J Am Diet Assoc*. 1999;99:973-976.
12. Moser GA, McLachlan MS. A non-absorbable dietary fat substitute enhances elimination of persistent lipophilic contaminants in humans. *Chemosphere*. 1999;39:1513-1521.
13. Jandacek RJ, Kester JJ, Papa AJ, Wehmeier TJ, Lin PYT. Olestra formation and the gastrointestinal tract. *Lipids*. 1999;34:771-783.
14. Sandler RS, Zorich NL, Filloon TG, et al. Gastrointestinal symptoms in 3181 volunteers ingesting snack foods containing olestra or triglycerides: a 6-week randomized, placebo-controlled trial. *Ann Intern Med*. 1999;130(4 pt 1):253-261.
15. Zorich N, Allgood G, Peters J. Sucrose polyester in human volunteers. *Br J Nutr*. 1999;81:169-170.
16. Middleton SJ. Procter & Gamble responds on olestra [letter]. *Public Health Rep*. 1999;114:5-6.
17. Kristal AR, Patterson RE, Neuhauser ML, et al. Olestra Postmarketing Surveillance Study: design and baseline results from the sentinel site. *J Am Diet Assoc*. 1998;98:1290-1296.
18. Hampl JS, Sheeley AE, Schnepf MI. Sounding the alarm for misuse of olestra-containing foods in binge-eating disorders [letter]. *J Am Diet Assoc*. 1998;98:971.
19. Miller DL, Castellanos VH, Shide DJ, Peters JC, Rolls BJ. Effect of fat-free potato chips with and without nutrition labels on fat and energy intakes. *Am J Clin Nutr*. 1998;68:282-290.
20. Hill JO, Seagle HM, Johnson SL, et al. Effects of 14 d of covert substitution of olestra for conventional fat on spontaneous food intake. *Am J Clin Nutr*. 1998;67:1178-1185.
21. Prince DM, Welschenbach MA. Olestra: a new food additive. *J Am Diet Assoc*. 1998;98:565-569.
22. Mattes RD. Position of the American Dietetic Association: fat replacers. *J Am Diet Assoc*. 1998;98:463-468.
23. Hunt R, Zorich NL, Thomson AB. Overview of olestra: a new fat substitute. *Can J Gastroenterol*. 1998;12:193-197.
24. Zorich NL, Biedermann D, Riccardi KA, Bishop LJ, Filloon TG. Follow-up to the study: a randomized, double-blind, placebo-controlled consumer rechallenge test of Olean salted snacks. *Regul Toxicol Pharmacol*. 1998;27(1 pt 1):2.
25. Cheskin LJ, Miday R, Zorich N, Filloon T. Gastrointestinal symptoms following consumption of olestra or regular triglyceride potato chips: a controlled comparison. *JAMA*. 1998;279:150-152.
26. Zorich NL, Jones MB, Kesler JM, Carter SB, Sutton MA, Bayless T. A randomized, double-blind study of the effect of olestra on disease activity in patients with quiescent inflammatory bowel disease. *Am J Med*. 1997;103:389-399.
27. Zorich NL, Biedermann D, Riccardi KA, Bishop LJ, Filloon TG. Randomized, double-blind, placebo-controlled, consumer rechallenge test of Olean salted snacks. *Regul Toxicol Pharmacol*. 1997;26:200-209.
28. Freston JW, Ahnen DJ, Czinn SJ, et al. Review and analysis of the effects of olestra, a dietary fat substitute, on gastrointestinal function and symptoms. *Regul Toxicol Pharmacol*. 1997;26:210-218.
29. Lawson KD, Middleton SJ, Hassall CD. Olestra, a nonabsorbed, noncaloric replacement for dietary fat: a review. *Drug Metab Rev*. 1997;29:651-703.
30. Peters JC, Lawson KD, Middleton SJ, Triebwasser KC. Assessment of the nutritional effects of olestra, a nonabsorbed fat replacement: summary. *J Nutr*. 1997;127(suppl 8):1719S-1728S.
31. Middleton SJ, Dwyer J, Peters JC. An indirect means of assessing potential nutritional effects of dietary olestra in healthy subgroups of the general population. *J Nutr*. 1997;127(suppl 8):1710S-1718S.
32. Cooper DA, Webb DR, Peters JC. Evaluation of the potential for olestra to affect the availability of dietary phytochemicals. *J Nutr*. 1997;127(suppl 8):1699S-1709S.
33. Daher GC, Cooper DA, Zorich NL, King D, Riccardi KA, Peters JC. Olestra ingestion and dietary fat absorption in humans. *J Nutr*. 1997;127(suppl 8):1694S-1698S.
34. Daher GC, Cooper DA, Zorich NL, King D, Riccardi KA, Peters JC. Olestra ingestion and retinyl palmitate absorption in humans. *J Nutr*. 1997;127(suppl 8):1686S-1693S.
35. Schlagheck TG, Kesler JM, Jones MB, et al. Olestra's effect on vitamins D and E in humans can be offset by increasing dietary levels of these vitamins. *J Nutr*. 1997;127(suppl 8):1666S-1685S.
36. Koonsvitsky BP, Berry DA, Jones MB, et al. Olestra affects serum concentrations of alpha-tocopherol and carotenoids but not vitamin D or vitamin K status in free-living subjects. *J Nutr*. 1997;127(suppl 8):1636S-1645S.
37. Cooper DA, Berry DA, Spindel VA, Jones MB, Kiorpes AL, Peters JC. Nutritional status of pigs fed olestra with and without increased dietary levels of vitamins A and E in long-term studies. *J Nutr*. 1997;127(suppl 8):1609S-1635S.
38. Cooper DA, Berry DA, Jones MB, Kiorpes AL, Peters JC. Olestra's effect on the status of vitamins A, D, and E in the pig can be offset by increasing dietary levels of these vitamins. *J Nutr*. 1997;127(suppl 8):1589S-1608S.
39. Cooper DA, Berry DA, Spindel VA, King D, Kiorpes AL, Peters JC. Olestra dose response on fat-soluble and water-soluble nutrients in the pig. *J Nutr*. 1997;127(suppl 8):1573S-1588S.
40. Daher GC, Cooper DA, Peters JC. Physical or temporal separation of olestra and vitamins A, E and D intake decreases the effect of olestra on the status of the vitamins in the pig. *J Nutr*. 1997;127(suppl 8):1566S-1572S.
41. Peters JC, Lawson KD, Middleton SJ, Triebwasser KC. Assessment of the nutritional effects of olestra, a nonabsorbed fat replacement: introduction and overview. *J Nutr*. 1997;127(suppl 8):1539S-1546S.
42. Westerterp-Plantenga MS, Wijckmans-Duijens NE, Hoor TH, Weststrate JA. Effect of replacement of fat by nonabsorbable fat (sucrose polyester) in meals or snacks as a function of dietary restraint. *Physiol Behav*. 1997;61:939-947.
43. Rolls BJ, Castellanos VH, Shide DJ, et al. Sensory properties of a nonabsorbable fat substitute did not affect regulation of energy intake. *Am J Clin Nutr*. 1997;65:1375-1383.
44. Williams GM, Aardema MJ, Long PH, Thompson ED, Allgood GS. Genotoxicity and subchronic toxicity studies and heated olestra. *Food Chem Toxicol*. 1996;34:941-950.
45. Kleinman RE, Schneeman B. Olestra and the FDA [letter]. *N Engl J Med*. 1996;335:668-670.
46. Daher GC, Lawson KD, Tallmadge DH, Vanderploeg P, Miller KW. Disposition of ingested olestra in weanling mini-pigs. *Food Chem Toxicol*. 1996;34:693-699.
47. De Graaf C, Hulsof T, Weststrate JA, Hautvast GA. Nonabsorbable fat substitute (sucrose polyester) and the regulation of energy intake and body weight. *Am J Physiol*. 1996;270(6 pt 2):R1386-R1393.
48. Cotton JR, Burley VJ, Weststrate JA, Blundell JE. Fat substitution and food intake: effect of replacing fat with sucrose polyester at lunch or evening meals. *Br J Nutr*. 1996;75:545-556.
49. Greenwood-Van Meerveld B, Neeley DE, Tyler KR, Peters LJ, McRorie JW. Comparison of effects on colonic motility and stool characteristics associated with feeding olestra and wheat bran to ambulatory mini-pigs. *Dig Dis Sci*. 1999;44:1282-1287.
50. Carek PJ, Dickerson LM. Current concepts in the pharmacological management of obesity. *Drugs*. 1999;57:883-904.
51. Maas MI, Hopman WP, Katan MB, Jansen JB. The nondigestible fat sucrose polyester does not stimulate gallbladder emptying in humans. *Am J Clin Nutr*. 1998;68:1272-1275.

52. Lawton CL. Regulation of energy and fat intakes and body weight: the role of fat substitutes. *Br J Nutr*. 1998;80:3-4.
53. Daher GC, Lawson KD, Long PH, et al. Comparison of olestra absorption in guinea pigs with normal and compromised gastrointestinal tracts. *Fundam Appl Toxicol*. 1997;39:138-147.
54. Schlagheck TG, Riccardi KA, Zorich NL, Torri SA, Dugan LD, Peters JC. Olestra dose response on fat-soluble and water-soluble nutrients in humans. *J Nutr*. 1997;127(suppl 8):1646S-1665S.
55. Cooper DA, Berry DA, Spendel VA, Kiorpes AL, Peters JC. The domestic pig as a model for evaluating olestra's nutritional effects. *J Nutr*. 1997;127(suppl 8):1555S-1565S.
56. Webb DR, Harrison GG, Lee MJ, Huang MH. Estimated consumption and eating frequency of olestra from savory snacks using menu census data. *J Nutr*. 1997;127(suppl 8):1547S-1554S.
57. Garn SM. From the Miocene to olestra: a historical perspective on fat consumption. *J Am Diet Assoc*. 1997;97(suppl 7):S54-S57.
58. Russell RM. Nutrition. *JAMA*. 1997;277:1876-1878.
59. Goldman P. Olestra: assessing its potential to interact with drugs in the gastrointestinal tract. *Clin Pharmacol Ther*. 1997;61:613-618.
60. Maas MI, Hopman EP, Wijk TV, Katan MB, Jansen JB. Sucrose polyester does not inhibit gastric acid secretion or stimulate cholecystokinin release in men. *Am J Clin Nutr*. 1997;65:761-765.
61. Kelly SM, Hunter JO. The effect of a non-absorbable fat substitute, sucrose polyester, on gastrointestinal function. *Aliment Pharmacol Ther*. 1996;10:715-720.
62. Cotton JR, Weststrate JA, Blundell JE. Replacement of dietary fat with sucrose polyester: effects on energy intake and appetite control in nonobese males. *Am J Clin Nutr*. 1996;63:891-896.
63. Lee DM, Ventullo RM. Degradation of olestra, a non caloric fat replacer, by microorganisms isolated from activated sludge and other environments. *Biodegradation*. 1996;7:257-265.
64. Harrell CC, Kline SS. Vitamin K-supplemented snacks containing olestra: implication for patients taking warfarin [letter]. *JAMA*. 1999;282:1133-1134.
65. Kelly SM, Shorthouse M, Cotterell JC, et al. A 3-month, double-blind, controlled trial of feeding with sucrose polyester in human volunteers. *Br J Nutr*. 1998;80:41-49.
66. Porterfield LM. A mysterious case of loose stools and GI cramps. *RN*. 1997;60(1):67.
67. Karstadt M, Jacobson MF. Olestra and the FDA [letter]. *N Engl J Med*. 1996;335:669-670.
68. Stampfer MJ, Willett WC. Olestra and the FDA [letter]. *N Engl J Med*. 1996;335:669.
69. Manning WJ. Olestra and the FDA [letter]. *N Engl J Med*. 1996;335:668-669.
70. Kantor MA. Olestra: questions still unanswered. *J Nutr Education*. 1996;28:191-192.
71. Thomas PR. Olestra: another technological fix for the food supply. *J Nutr Education*. 1996;28:193-194.
72. Cerrato PL. The absolute skinny on the new fat substitute. *RN*. 1996;59(6):38-39.
73. Blackburn H. Olestra and the FDA. *N Engl J Med*. 1996;334:984-986.
74. Miller GD, Groziak SM. Impact of fat substitutes on fat intake. *Lipids*. 1996;31(suppl):S293-S296.
75. Meyer JH, Elashoff JD, Lake R. Gastric emptying of indigestible versus digestible oils and solid fats in normal humans. *Dig Dis Sci*. 1999;44:1076-1082.
76. Kelly LA, Chavez M, Berthoud HR. Transient overconsumption of novel foods by deafferented rats: effects of novel diet composition. *Physiol Behav*. 1999;65:793-800.
77. Schul D, Tallmadge D, Burress D, Ewald D, Berger B, Henry D. Determination of fat in olestra-containing savory snack products by capillary gas chromatography. *J AOAC Int*. 1998;81:848-868.
78. Maas MI, Hopman WP, Katan MB, Jansen JB. Release of peptide YY and inhibition of gastric acid secretion by long-chain and medium-chain triglycerides but not by sucrose polyester in men. *Eur J Clin Invest*. 1998;28:123-130.
79. Figge K, Haigh-Baird SD. Biodegradation of sucrose poly fatty acid esters in soils. *Chemosphere*. 1997;34:2621-2636.
80. Nestle M. *Food Politics: How the Food Industry Influences Nutrition and Health*. Berkeley, Calif: University of California Press; 2002.
81. Krinsky S, Rothenberg LS. Conflict of interest policies in science and medical journals: editorial practices and author disclosures. *Sci Eng Ethics*. 2001;7:205-218.
82. Munn MD. *Origin and Development of the National Dairy Council* [unpublished report]. Chicago, Ill: National Dairy Council; 1943.



Community-Based Public Health: A Partnership Model

Edited by Thomas A. Bruce, MD, and
Steven Uranga McKane, DMD

Published by APHA and the W.K.
Kellogg Foundation

Developing meaningful partnerships with the communities they serve is crucial to the success of institutions, non-profit organizations and corporations. This book contributes to a wider understanding of how to initiate and sustain viable partnerships and improve community life in the process. *Community-Based Public Health: A Partnership Model* focuses on public health practice in communities, the education and training of public health professionals at colleges and universities, and public health research and scholarly practice within academic institutions.

ISBN 0-87553-184-9

2000 ■ 129 pages ■ softcover

\$17.00 APHA Members

\$22.00 Nonmembers

plus shipping and handling

American Public Health Association



Publication Sales

Web: www.apha.org

E-mail: APHA@TASCO1.com

Tel: (301) 893-1894

FAX: (301) 843-0159

KL02J2