



Turning the Tide

The trend toward increased obesity may be reversing itself, although challenges remain. Prepared Foods' "R&D Trends: Weight Control Formulations" survey looks at manufacturers' attitudes toward product positioning and ingredients for weight control.

Claudia Dziuk O'Donnell, Chief Editor

I ncreasing weight is an issue of concern in nearly every developed nation and more than a few emerging markets. However, even as “globesity” sweeps the world, with Americans presented as prime examples, unexpected positive data exist as well.

The level of obesity in this country appears to have peaked, said Joe Derochowski, director of business development for NPD Foodworld at the 2006 *Prepared Foods* New Products Conference. (See “Forecasting Foods’ Future” in *Prepared Foods*, January 2007.) His statement is supported both by NPD Group research that found the percentage of overweight adults has held steady from 2002 to 2005 and by objective, in-person measurement data from U.S. Centers for Disease Control and Prevention’s (CDC) “National Health and Nutrition Examination Survey.” The latter study, which compares data from slightly earlier time periods of 1999-2000 and 2003-2004, shows the percent of overweight women holding steady at 62% with the subgroup of obese women at a constant 33%.

Now the bad news: Some 66% of U.S. adults and 17% of U.S. children are overweight or obese, according to the

CDC data as reported in the *Journal of the American Medical Association* (2006, pp 1577-1578). Additionally, at least through 2003-2004, men and children had continued to gain weight. However, it is hoped that the leveling in weight gain shown in women may signal a turning point in the nation’s obesity epidemic. “Women have always been more responsible about health than the general population,” says William Dietz, director of the CDC’s Division of Nutrition and Physical Activity. “I’d like to think this shows women are leading the way in recognizing obesity as a health threat.”

Although packaged prepared foods—whether sold through retail or foodservice distribution channels—have long been under fire for contributing to obesity, the food industry has given equal time to development of weight control foods valued by consumers. For example, the formulation of reduced-fat foods followed only “nutritional database development” and





“line extensions” as the top product development issue of food manufacturers in the 1994 “*Prepared Foods R&D Investment Survey*.”

Over a decade has since passed. Well aware of the politics of obesity and yet also required to remain profitable by their shareholders, do food manufacturers still believe the development of new reduced-fat foods presents a good business opportunity? What ingredients are seen as the most useful for products geared toward the weight control market? *Prepared Foods’* “2006 R&D Trends: Weight Control Formulations,” a survey compiled in October 2006, answers some of these questions.

Mr. and Mrs. Sprat

In the centuries-old nursery rhyme, “Jack Sprat could eat no fat; his wife could eat no lean.” Fast-forwarding to the 21st century, we find Mrs. Sprat now in agreement with her husband; both are concerned with their foods’ fat content. Also in agreement are food companies’ R&D and marketing functions, as they placed “reduced-fat” as the number-one type of formulation they felt consumers look to in solving weight problems. “Low-calorie” falls closely behind. (See chart “No Difference in Opinion.”)

Some consumer studies place interest in low-calorie foods slightly ahead of low-fat. Many others still rank reduced-fat at the top. In the 2006 “What America Eats” survey of 1,015 adults by *Parade* magazine, 50% of consumers say they would buy a reduced-fat product, while about four in 10 would choose products that are high in fiber, low in calories, all-natural or low in saturated fats.

PF’s “Weight Control Formulations” survey reports that reduced/no-sugar products fall next in line after low-calorie as products to which consumers will turn for weight maintenance efforts, followed by no-fat. (No-fat versions of full-fat traditional food prod-

No Difference in Opinion

Formulation Type	Titles R&D	Titles Marketing
Reduced-fat	4.30	4.26
Low-calorie	4.07	4.14
Reduced sugar	3.81	3.83
Sugar free	3.56	3.65
No-fat	3.56	3.61
High protein	3.49	3.23
Low carbohydrate	3.42	3.50
Low glycemic index	3.32	3.12

Source: “*Prepared Foods’ R&D Trends: Weight Control Formulations*,” October 2006, R&D titles, n = 214; marketing titles, n = 60 (multiple responses allowed)

Those surveyed were asked, “Please rate each of the following types of food and beverage ingredient formulations you believe consumers will look to for assistance in helping to solve a weight problem (1=not likely, 5=very likely).” “Reduced-fat” was rated highest by both R&D and marketing titles, receiving a mean score of 4.30 and 4.26, respectively.

ucts are often of disproportionately lower quality than reduced-fat versions, since even small amounts of fat provide great sensory benefits in a food matrix.)

The number of new low-fat food introductions has declined some in the last half decade but not substantially, says Lynn Dornblaser, director, Custom Solutions Group, Mintel International. “It’s still the biggest of the ‘low in’ claims,” she adds. When asked to comment on why various recent *Prepared Foods* surveys have failed to uncover much

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American women are no longer gaining weight, but obesity in children has become a defining issue for the U.S. food industry.

interest by food companies in learning more about formulating reduced-fat products, she offers that, "Manufacturers already know how to do low-fat. They figured it out in the 1990s." Indeed, through advances in manufacturing processes and functional ingredients, food technology has enabled the development of high-quality, lower-calorie foods.

Enabling Ingredients

One need only compare products such as Edy's Slow

Churned Light Ice Cream to the somewhat chalky, hard ice milks of years past to see how greatly food science has helped improve food quality. (Before passage and implementation of the NLEA in the early 1990s, the FDA required the name "ice milk" be used for ice creams of less than 10% milkfat.)

While processing may be a key element to producing a sensory-pleasing Edy's Rich & Creamy Cookie Dough No Sugar Added Light Ice Cream, the product does list a plethora of helpful ingredients on its label. Any single ingredient usually provides more than one benefit, of course. However, a simple analysis shows that lactitol, sucralose, maltitol syrup, sorbitol and acesulfame potassium (ace-K) all provide a degree of sweetness. The polyols just mentioned, along with maltodextrin, polydextrose, milk minerals concentrate, cellulose gum, guar gum and carrageenan contribute to body and smoothness that are lost when fat is lowered. Eggs, mono- and diglycerides and soy lecithin assist with emulsification and, again, smoothness. Additionally, a careful selection of flavorings and texturizing additives help provide a creamy flavor. The end result is a half-cup serving of ice cream with 110 calories, 8% of the daily value for dietary fiber and the label claim, "A Good Source of Calcium to Help Maintain Strong Bones."

The heavy reliance on food ingredients should bode well for many suppliers. Indeed, a March 2006 report, "U.S. Food Emulsifier Markets," by Frost & Sullivan, estimates the emulsifier market will grow from \$505 million to \$668 million by 2012. "The rising consumer demand for low-fat foods has compelled manufacturers to opt for emulsifiers to reduce cholesterol levels as well as tackle health issues such as obesity and heart diseases," notes a Frost & Sullivan analyst. The firm explains that emulsifiers allow food manufacturers to produce a low-fat spread with 10% to 40% fat compared to 40% to 60% fat in other foods [or more significantly, the 80% of traditional margarines]. "Emulsifiers help in overcoming concerns pertaining to stability, viscosity and organoleptic properties encountered with the reduction of fat content," it notes.

With industry trends such as cleaner ingredient statements to "cleaner" raw material warehouses (that is, with fewer SKUs to manage), the demand for "multi-purpose" ingredients grows. Thus, a more desirable emulsifier will be one that can function as a stabilizer and as a low-fat substitute. Add on characteristics such as the ability to be used in organic products or being trans-fat free, and the component will have an easier path into the marketplace.

Keeping Up Appearances

In addition to functionality, people in product development are often concerned with consumer perceptions of a particular ingredient. In this year's "Weight Control Formulations" survey, one question investigated food manufacturers' opinions on what ingredients or categories consumers would recognize as beneficial in a food or beverage product designed for weight control. (See chart "Back of the Label.") Dietary fiber and whole grains ranked at the top of their list with 70% and 63% (respectively) of 2006 survey respondents saying that consumers understood these components to be of value. These items were followed by vegetables and fruit (including grapefruit).

Both clinical research in support of and marketing efforts by the dairy industry have likely increased consumers' acceptance of dairy products' role in weight control. However, in this survey, noticeably fewer respondents this year compared to last indicated they felt consumers recognized that connection. Both soy and whey protein categories also fell. It could be theorized that the perceived weakening of all three reflects the decreased popularity of low-carb/high-protein diets. Although, in general, this year's crop

Product developers were asked, "What ingredient(s) or ingredient categories do you personally believe could assist in the formulation of a food or beverage product for consumers concerned about weight? (Check all that apply.)"

of 360-plus respondents voted more conservatively than last year's respondents—almost across the board—in regards to consumers' ability to recognize the weight-loss role of these ingredients.

One notable exception was green tea. Positive press, including support for green tea's "thermogenic" (aka fat burning) properties, continues to roll out. Among many beneficial components, tea contains a goodly dose of stimulants in the form of caffeine, theobromine and theophylline. Consumer media has referred to tea and certain other foods as having "negative calories," meaning that the body uses more calories to digest the food than it gains from it.

While the usefulness of negative calories as a concept is controversial, Coca-Cola, in a partnership with Nestlé, nationally launched a carbonated green tea drink containing caffeine and calcium under the name Enviga in January 2007. A Coca-Cola press

Product Developer Opinions

(% Saying They Believe Beneficial)

Dietary fiber	73
Whole grains	67
Vegetables	53
Fruit	47
Soy protein	44
High-intensity sweeteners (e.g., aspartame, ace-K)	40
Green tea	38
Omega-3 fatty acids	37
Whey protein	33
Calcium	31
Dairy products	30
Gums (hydrocolloids, such as xanthan gum, guar gum)	25
Sugar polyols (e.g., sorbitol, mannitol)	25
Resistant starch	21
Grapefruit	18
Conjugated linoleic acid (CLA)	16
Chromium	14
Polydextrose	13
Medium-chain triglycerides (MCTs)	9
L-carnitine	8
DAG (1,3 diacylglycerol)	6

Source: "Prepared Foods' R&D Trends: Weight Control Formulations," October 2006, n=367 (multiple responses allowed)

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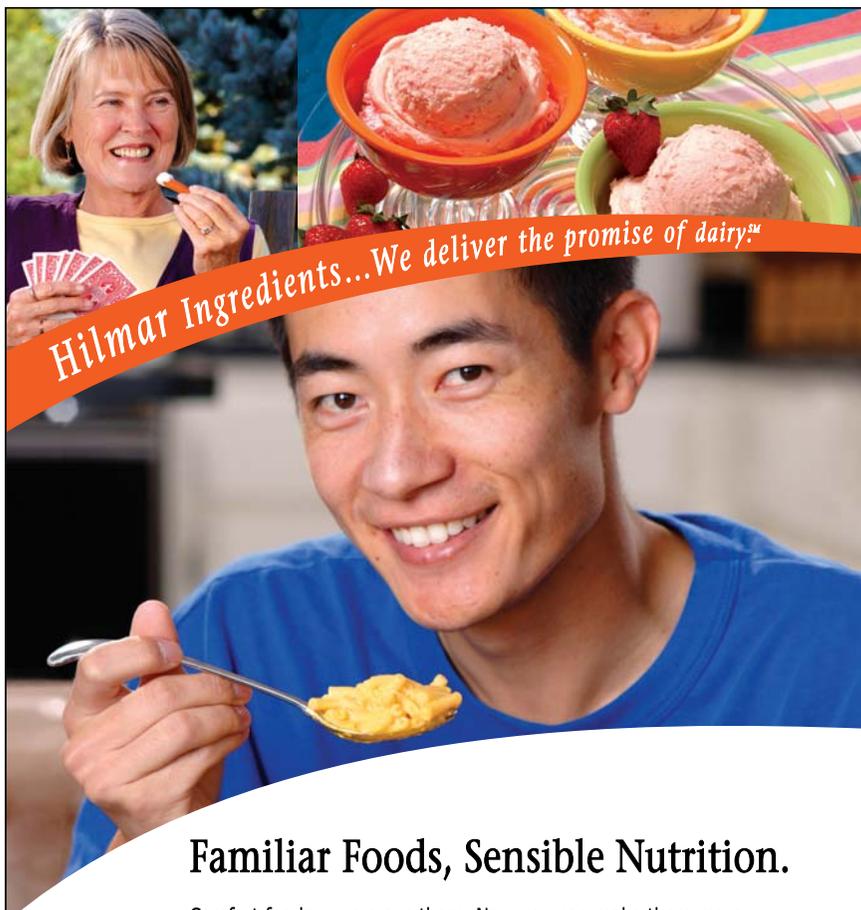
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release quotes Rhona Applebaum, PhD, its chief scientist, as saying, “Enviga increases calorie burning...Enviga contains the optimum blend of green tea extracts, caffeine and naturally active plant micronutrients designed to work with your body to increase calorie burning, thus creating a negative calorie effect.” Never to be left behind, Pepsi-Cola North America is launching in June 2007 a healthful drink with

chromium called Tava, according to *Advertising Age*. Chromium is tied to weight loss. Respondents to *PF*'s survey ranked chromium about the same as resistant starch as a consumer-recognized ingredient useful in weight-loss efforts.

Ingredients such as polyols, resistant starch, polydextrose and other hydrocolloid gums are the darlings of R&D in reduced-fat and -calorie products due to their physical properties. (See chart “Product Developer Opinions.”) It is not surprising that consumers are not expected to understand their benefits. Consumers are not food scientists, nor are they nutritional researchers, and the science of weight management is becoming ever more complicated.



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Sophisticated Science

The food industry's interest in products with a low glycemic index (GI) continues. These products tend not to spike insulin levels. However, when manufacturers were asked what types of foods they believe consumers will look to for assistance in helping to solve a weight problem, low glycemic came in last of the choices offered. This does not mean it is not an area for future opportunity. A December 2006 report from Packaged Facts entitled “Low Glycemic Index Foods and Beverages in the U.S.” predicts sales of low-GI products will experience a compound annual growth rate of 45.7% through 2011, when the category will reach \$1.8 billion.



Enviga, a product from a joint venture between Nestlé and Coca-Cola, contains green tea extracts and caffeine to “enhance the calorie burning process.”

Currently, however, low-glycemic products exemplify the dichotomy between what consumers see as important in weight control versus what science is discovering. “Low-glycemic itself is a difficult concept for consumers to understand,” says Dornblaser. There are more consumer-friendly ways to talk about the benefits of such products: “sustaining blood glucose levels,” “eliminate that mid-afternoon crash,” “feel full longer” or the product will “tide you over until lunch.”

“Consumers don’t know what the glycemic index is,” agrees Rhonda Witwer, business development manager of nutrition with a company that supplies resistant starch, a type of fiber. “They understand fiber and weight, partly because Weight Watchers puts so much emphasis on fiber. Consumers know they can eat more of a food if it contains more fiber.”

However, while consumers tend to think all fiber is the same, it is not, says Witwer. Some fibers are theorized to be helpful in weight control because they add bulk—which delays gastric emptying and which may stimulate intestinal signaling pathways. Other fibers are theorized to be helpful because they “dilute” calories, deliver less energy and may interfere with fat absorption. Now, research is investigating complex metabolic relations resulting from fermentation within the intestinal tract such as the role of food components on “hunger hormones” like ghrelin, orexin and GLP-1; on “satiety hormones” such as leptin and obestatin; and on “metabolic hormones” such as insulin.

One research group in Louisiana has structured a series of experiments that show that the fermentation of natural resistant starch causes more metabolic impact than bulking and energy dilution effects. For instance, the genetic expression of particular genes for GLP-1, which pushes the body’s physiology toward effective regulation of insulin and glucagon, were significantly up-regulated by fermentation of natural resistant starch, says Witwer. Diets containing cellulose with the same bulking impact and the same energy content did not have the same metabolic effect. Additional research has also demonstrated that natural resistant starch’s fermentation increases insulin sensitivity, increases lipid oxidation (with stored fat

being “burned” preferentially over dietary carbohydrates or proteins) and decreases abdominal obesity in animal models, she adds. These abilities are being researched in other ingredients as well. For example, some research indicates that relative to longer chained triglycerides, the consumption of medium-chain triglycerides (MCTs) increases fat oxidation.

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Back of the Label

(% Saying Consumers Recognize as Beneficial in Weight-loss Products)

Ingredient/Category	2006	2005
Dietary fiber	70	70
Whole grains	63	65
Vegetables	56	58
Fruit	43	46
Green tea	42	28
High-intensity sweeteners (e.g., aspartame, ace-K)	41	42
Soy protein	35	47
Grapefruit	30	15
Calcium	29	34
Omega-3 fatty acids	27	35
Whey protein	19	32
Dairy products	19	28
Sugar polyols (e.g., sorbitol, mannitol)	15	27
Chromium	8	13
Resistant starch	7	20
Conjugated linoleic acid (CLA)	6	14
Gums (hydrocolloids, such as xanthan gum, guar gum)	5	23
L-carnitine	3	7
Medium-chain triglycerides (MCTs)	3	6
Polydextrose	3	13
DAG (1,3 diacylglycerol)	2	6

Source: "Prepared Foods' R&D Trends: Weight Control Formulations," October 2006, n=366; 2005, n=360 (multiple responses allowed)

The survey asked, "What ingredient(s) or categories listed on the package ingredient statement do you believe the consumer would recognize as beneficial in a food or beverage product designed for weight loss?" In general, respondents to the 2006 survey seemed more jaded than those in 2005, almost across the board, although ranking for individual ingredients remained very similar.

In the end, however, consumers are looking for foods that fit into their diet and lifestyle. Only the most motivated will stick to a weight-loss diet that does not taste great. The food industry needs to continue working to develop great tasting foods and beverages that benefit weight management. It also needs to take a more proactive role in educating consumers about helpful ingredients, says Witwer. She feels that if consumers only live by what they currently know about food ingredients, the obesity situation will not change. **PF**

Website Resources:

<http://jama.ama-assn.org/cgi/content/extract/295/13/1577> — Published review of CDC's study on American obesity

www.frost.com/prod/servlet/report-brochure.pag?id=F692-01-00-00-00 — Frost & Sullivan summary of its 2006 emulsifier market report

www.cftech.com/BrainBank/OTHERREFERENCE/HEALTH/StimulantPlants.html — A discussion of plant purinergic stimulants (caffeine, theobromine, theophylline) found in coffee, cocoa, guarana, mate and kola

www2.coca-cola.com/presscenter/pdfs/enviga.pdf — Coca-Cola press release on Enviga

www.caloriecontrol.org/pressrm.html — News primarily focused on high-intensity sweeteners

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