

NUTRITION PERSPECTIVES

Volume 28, No. 6
November/December 2003

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Sheri Zidenberg-Cherr, PhD, Nutrition Specialist, Cristy Hathaway, and staff prepare NUTRITION PERSPECTIVES. It is designed to provide research-based information on ongoing nutrition and food-related programs. It is published bimonthly (six times annually) as a service of the University of California Cooperative Extension and the United States Department of Agriculture. Subscription to NUTRITION PERSPECTIVES is available from UC Cooperative Extension, Department of Nutrition, University of California, Davis, California. Cost is ten dollars (\$10.00) for a one-year subscription. Subscriptions and questions or comments on articles may be addressed to: NUTRITION PERSPECTIVES, University of California, Department of Nutrition, One Shields Ave., Davis, CA 95616-5270. Phone (530) 752-3387; Fax (530) 752-8905.

RESEARCH OUTCOMES ON LOW-CARBOHYDRATE DIETS

The first known recorded low-carbohydrate diet to have enjoyed popular success was described by William Banting in the 1860s (1). Banting claimed that he lost 46 pounds in a year while never being hungry; thousands followed his diet regime. Today the low-carbohydrate crusader is Dr. Robert Atkins, who died earlier this year. His book, Dr.

Atkin's New Diet Revolution has been on the New York Times bestseller list for the last five years (2). Concurrently, professional organizations in the field of nutrition have cautioned against following a diet that restricts carbohydrate intake to 20 grams (g), as required in the first phase of the Atkins diet (3). There is a concern from these opponents that low-carbohydrate diets lead to abnormal metabolic function that may lead to serious medical complications, particularly those with cardiovascular disease. The Dietary Guidelines for Americans, published by the United States Department of Agriculture (USDA) recommends a diet based on the Food Guide Pyramid's 6-11 servings of Bread, Cereal, Rice and Pasta, all carbohydrates. This amount equates to 90-165g of carbohydrates daily, clearly out of range for the Atkins diet (4). A person on a traditional diet consisting of 1200 calories could consume 48g of carbohydrates, almost 2.5 times that of the Atkins diet. Five intervention studies and one meta-analysis were published this year that examined low-carbohydrate diets and their long-term effects. Below are some of their key findings.

What constitutes a low-carbohydrate diet?

The Atkins diet limits carbohydrate intake to 20g/day for the initial phase, which lasts 14 days minimum (2). To place this in context, 100g of cooked pasta (~3.4 oz., or less than 1/2 cup) has 75g of carbohydrates. Likewise, a fresh apple with the skin on contains 29.27g. Even during Atkin's maintenance phase, which allows up to 60g of carbohydrate, an Atkin's dieter could not eat a half a cup of pasta, but could eat half an apple, which would maximize their daily allotment.

Why choose a low carbohydrate diet?

The metabolic theory that diets such as Atkins base their weight loss regimen on is that restricted carbohydrate and high fat/protein intake creates a "metabolic advantage" (2). Reduced glucose availability derived from decreased carbohydrate intake switches a person's metabolism from burning sugar to burning stored fat, known as lipolysis. Furthermore the theory states, with a high fat diet the dieter is less hungry and more likely to eat less food creating a caloric deficit, furthering weight loss. Contradicting this theory are results from a recent clinical trial demonstrating that diet composition had no effect on weight loss (6).

Low carbohydrate diets and weight loss

Published recently in the New England Journal of Medicine (NEJM) are two clinical trials that addressed the current trend of eating high fat/protein, low carbohydrate diets. Results from both studies showed that weight loss occurs rapidly in the first few months of a high fat/protein, low carbohydrate diet, however, no significant difference in weight loss between diet compositions was seen at either the six month trial or the twelve month trail (5,7). Another clinical trial published in the American Journal of Clinical Nutrition found at the end of four months a significant difference in weight loss, but the decrease in weight was not affected by diet composition (6). Conversely, an Atkins funded, non-randomized, non-control intervention trial, published in The American Journal of Medicine found sustained weight loss, -9.0 ± 5.5 kg, in low carbohydrate dieters at six months (8).

Low carbohydrate diets and triglyceride levels

According to the American Heart Association [AHA], high triglycerides (TGs) are associated with Type 2 diabetes, coronary heart disease, and obesity (10). Reducing intakes of carbohydrates, saturated fat, and weight, if obese, will promote lower TGs levels. AHA recommends TGs below 150mg/dl.

Foster and colleagues (5) found TGs levels decreased with the low-carbohydrate diet at the end of 12 months. Although part of this benefit may be due to the greater weight loss with the low-carbohydrate diet, the changes are greater than those expected from a moderate weight loss alone. However, comparison of subjects who lost the same total amount of weight demonstrated that this finding was limited to subjects who lost greater than five percent of their base-line weight.

Low carbohydrate diets cholesterol levels

The Foster trial found that at the end of three months LDL cholesterol was 6 percent lower than base-line, in the traditional diet, but at twelve months there was no significant differences between groups (5). The Farnsworth and Samaha trials reported that LDL cholesterol concentration among subjects on the low-carbohydrate diet was similar to base-line values, and the changes in LDL cholesterol concentrations did not differ significantly between groups (6,7). However, HDL levels varied among intervention trials, levels in some participants went up whereas others went down.

In an isocaloric intervention trial, published in the Journal of Nutrition, designed to only measure changes in total, LDL and HDL cholesterol in normal weight women consuming either a low carbohydrate or low fat diet, participants following a low carbohydrate diet had increased HDL's, and decreased triglycerides (9).

Low carbohydrate diets and blood pressure

With a decrease in weight loss a decrease in blood pressure is expected. Surprisingly, in all three trials measuring blood pressure, (5,6,7) blood pressure did not change significantly in any of the groups. However, many participants were on blood pressure lowering medications at baseline.

Low carbohydrate diets and ketones

High ketone levels are correlated with increased burning of fat stores. Only the Foster trial (5) tested for urinary ketones. During the first three months, the percentage of patients who tested positive for urinary ketones was significantly greater in the group on the low-carbohydrate diet, but there were no differences between the groups after three months. There was no significant relation between weight loss and ketosis at any time during the study (5).

Low carbohydrate diets and osteoporosis

Loss of calcium over time may lead to osteoporosis. Urinary calcium was unchanged regardless of the diet composition as measured in the Farnsworth trial (6). The concentrations of bone turnover markers (pyridinoline and deoxypyridinoline compared to creatinine) also did not differ between baseline and the end of the trial.

Attrition

Research has demonstrated that long-term, restrictive, dietary compliance leads to diet failure. Although many factors contribute to dietary compliance, adhering to a low carbohydrate diet may be more difficult than purported by Dr Atkins (2). Drop out rates were high for both the low carbohydrate and traditional carbohydrate groups (5,6,7).

The bottom line

For years the idea of promoting a low carbohydrate/high diet was fiercely dismissed by nutrition professionals. It is clear from recent studies that this is an area that obviously requires additional research. At this time the data can be summarized as follows:

- The first few months of a low-carbohydrate diet may initiate weight loss quickly, but at one year the difference in weight loss shows no relationship to macronutrient composition.
- Triglycerides levels decrease with a low-carbohydrate diet, though more studies are needed to determine if there is a positive correlation between macronutrient compositions, or if the decrease is related to a decrease in total weight loss.
- Biomarkers for heart disease: LDL, HDL and total cholesterol were not associated with diet composition at twelve months. HDLs initially increase on a low carbohydrate diet.
- The strongest correlation between weight loss and diet is a decrease in total calories.

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Source: Deanna Pucciarelli, Doctoral Student, Nutrition Department, University of California, Davis.

FDA SEIZES BOGUS DIETARY SUPPLEMENT THAT CLAIMS TO CURE CANCER

At the request of the US Food and Drug Administration (FDA), US Marshals recently seized the dietary supplements, Forticel and Forticel Mix, from Jean's Greens in Norway, N.Y. After an investigation of this company and its marketing practices the FDA has determined that Jean's Greens is making unapproved medical claims for these herbal products. Specifically, the products claim to treat and cure various life-threatening and serious illnesses such as cancer, although there is no scientific evidence to support these claims. The seizure included 385 bottles and 78 mix packages worth more than \$4,000.

"The FDA is committed to rooting out modern purveyors of snake oil," said FDA Commissioner Mark McClellan, MD, PhD. "These unscrupulous merchants not only cheat unsuspecting consumers, but they also endanger patients by encouraging them to substitute their bogus products for legitimate and proven remedies. Consumers must have accurate and truthful information so they can make informed choices, and the FDA will continue its aggressive enforcement efforts against companies that make misleading claims about their products."

Under the Federal Food, Drug and Cosmetic Act, products labeled as dietary supplements cannot make any claims that the products will cure, mitigate, treat, or prevent disease. Such claims on a dietary supplement would render the product a drug and subject to FDA approval before marketing. Moreover, the labeling must be truthful and not misleading.

Because the Forticel and Forticel Mix products make disease claims, the FDA considers these products to be unapproved new drugs. Before a new drug product is approved for marketing, it must be shown to be safe and effective. Furthermore, drug product labeling must also include adequate directions for their intended use, which the seized products' labeling did not provide.

After its investigation of the firm's marketing practices, the FDA advised the firm that its products were making disease claims and are subject to be regulated as drugs. Despite the FDA's warnings, the firm failed to comply.

This recent action continues the FDA's stepped-up enforcement actions against dietary supplements that falsely claim they can treat life-threatening diseases. This year alone, the agency has taken the following actions against firms making false and misleading claims about its dietary supplements:

- issued 73 warning letters and cyber letters (letters to internet sites illegally marketing FDA regulated products) to marketers of dietary supplement products,
- refused import of 368 foreign shipments of dietary supplement products offered for entry to the US, and
- supervised the voluntary destruction of \$515,000 worth of dietary supplements promoted with unsubstantiated structure/function claims.

To date the FDA has received no reports of illnesses associated with taking the products that were seized from the Forticel and Forticel Mix products.

Adapted from: FDA Press Release; September 18, 2003.

BOOK REVIEW:

THE 2003 EDITION OF HOW TO TEACH NUTRITION TO KIDS HAS BEEN RELEASED

Completely revised and updated, this resource promotes positive attitudes about food, fitness and body image. The book features hundreds of fun, hands-on nutrition education activities aimed at children ages 6-12. You can find out more about the book and our other nutrition education resources by visiting <http://nutritionforkids.com>.

Source: Connie Evers, MS, R.D, Child Nutrition Consultant/Author, <http://nutritionforkids.com>; November 10, 2003.

RESOURCES:

STATE LEGISLATION SEARCHABLE DATABASE IS ACTIVE

The Division of Nutrition and Physical Activity at the Centers for Disease Control and Prevention (CDC) is pleased to announce the launch of the State Legislation Searchable Database. The database allows users to search for state bills from 2001 to present related to nutrition and/or physical activity. You are asked to pick either nutrition or physical activity on the first page or you may select the either option for the whole database. Users can use search fields, enter keywords, or search the entire database. There are no required search fields, so if you simply hit "search" you will be able to access all bills in that subject area. This database is available to the general public and no registration or password is required.

This database will allow you to search for bills in your own state, neighbor states, region or the entire nation. The name of the primary sponsor is included in the record, so allies in the legislature may be identified from this database.

Please visit the database at <http://apps.nccd.cdc.gov/DNPALeg/>. You can also link to it on the division's home page at <http://www.cdc.gov/nccdphp/dnpa/index.htm>

Source: Public Health Nutrition Discussion and Information Group News Release; November 4, 2003.

"BABY'S FIRST YEAR CALENDAR" A FANTASTIC EDUCATIONAL RESOURCE

The very popular "Baby's First Year Calendar" published by the Alabama Cooperative Extension System is ready to be reprinted, but now a Spanish version "Calendario del Primer Año de Vida del Bebe" will also be produced in cooperation with the University of Georgia, with new illustrations depicting an even more diverse audience.

Here are some points of interest for the publication:

- Enjoyed by more than 250,000 families across the nation
- Widely popular for more than 10 years
- Updated with each printing
- Immunization and developmental information
- Nutrition tips
- Original artwork and illustrations representing diverse ethnic groups
- Page of 70 stickers to chart child's progress
- Family tree diagram
- Modest cost: \$1.25 to \$1.50 (plus shipping) per calendar/sticker page
- Customization option: With an order of 2,000 or more, you can customize your calendars with your state's Extension logo and contact information.

Feel free to contact Glenda Freeman, Editor, Extension Communications, 129 Duncan Hall Annex, Auburn University, AL 36849, Phone: 334-844-5694, Fax: 334-844-4919, E-mail: gfreeman@aces.edu, if you have questions.

Adapted from: Extension Communications News Release; November 18, 2003.

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