

Rarely, intestinal **cancer** may develop in a person with Meckel's diverticulum, although this occurs more often in adults than children.

### Risks

The risk of complications in patients who have not experienced symptoms is nearly zero. Patients who are not experiencing symptoms usually do not require surgical treatment.

Without treatment, a symptomatic person with Meckel's diverticulum can lose enough blood that he or she goes into shock. In some cases, the intestine could rupture and leak waste into the abdomen, increasing the risk of serious infection. In rare cases, the complications associated with Meckel's diverticulum may be life-threatening.

According to the American Pediatric Surgical Association, there is a less than 2% risk of complications associated with surgical treatment of Meckel's diverticulum. Post-surgical intestinal blockage from scar tissue occurs in just 5% to 9% of patients.

Gastrointestinal functioning and nutrition remain unaffected after treatment for Meckel's diverticulum. After surgery to remove the pouch and any intestinal blockage, symptoms will not recur. The prognosis for someone with Meckel's diverticulum is excellent.

### Research and general acceptance

Treatment for a person with symptoms of Meckel's diverticulum is fairly straightforward and engenders little or no medical controversy.

When physicians are considering treatment options, determining whether to remove an asymptomatic Meckel's diverticulum may be controversial. Some research has indicated that age may play a role in the decision to remove a Meckel's diverticulum. A study in adults indicated that removal of asymptomatic diverticulum may benefit people under 50 years of age.

### Resources

#### PERIODICALS

- McKay R. High incidence of symptomatic Meckel's diverticulum in patients less than fifty years of age: an indication for resection. *American Surgeon*, 2007 Mar 73(3): 271-5.
- Sagar J, Kumar V, Shah DK. Meckel's diverticulum: a systematic review. *Journal of the Royal Society of Medicine*, 2006 Oct;99(10):501-5.

#### ORGANIZATIONS

- American Academy of Pediatrics. 141 Northwest Point Boulevard, Elk Grove Village, IL 60007-1098. (847) 434-4000. <<http://www.aap.org>>

## QUESTIONS TO ASK YOUR DOCTOR

- How serious is my condition?
- Will I need surgery to treat my condition?
- How long will it take me to recover after surgery, and what can I expect after recovery?
- What dietary changes will I need to make after treatment?
- Are there any long-term changes I need to make after surgery for Meckel's diverticulum?
- My child is undergoing surgery. Are there any complications associated with pediatric surgery for Meckel's diverticulum that I need to be concerned about?

American College of Gastroenterology. PO Box 3099, Alexandria, VA 22302. (800) HRT-BURN. <<http://www.acg.gi.org>>

American Gastroenterological Association. 7910 Woodmont Ave., 7th Floor, Bethesda, MD 20814. (310) 654-2055. <<http://www.gastro.org>>

American Pediatric Surgery Association. 60 Revere Drive, Suite 500, Northbrook, IL 60062. (847) 480-9576. <<http://www.eapsa.org>>

National Digestive Diseases Information Clearinghouse. 2 Information Way, Bethesda, MD 20892. (800) 891-5389. <<http://digestive.niddk.nih.gov>>

Amy L. Sutton

## Medifast

### Definition

The Medifast diet is a portion-controlled, low-fat, low-carbohydrate, low-calorie diet plan that utilizes meal replacement foods that are obtained from the Medifast company. These meal replacement foods are nutrient-dense and low-calorie. As a low-calorie diet, the Medifast diet is intended to produce rapid weight loss at the start of a weight-loss program for persons who are moderately to extremely obese.

### Origins

The Medifast diet was created and is marketed by Jason Pharmaceuticals, based in Owings Mills, Maryland. Dr. William Vitale founded the company in

Medifast®								
Medifast® product	Calories per serving	Protein (g)	Carbohydrates (g)	Fat (g)	Cholesterol (mg)	Sodium (mg)	Potassium (mg)	Fiber (g)
55 shakes	90	11	13–14	0–1	0	250	420–440	3
70 shakes	100–110	14	13–14	0.5–1	0	240–250	400–430	3
Ready-to-drink shakes	90	11	12	1–1.5	0	190–200	370–480	3
Appetite suppression shakes	100	15	12	0.5–1	0	210	400	4
Diabetic shakes	90	14	9–10	0.5–1	0	250	400	3
Women's health shakes	110	14	15	1	0	190	480	4
Bars	150–170	11	18–23	3.5	0	140–170	260–310	4–5
Diabetic bars	140	10–11	23–23	4–5.5	0	160–170	320–350	4
Soups	90–110	9–11	12–19	1	0	290–350	400–600	3–4

Amounts vary with product flavors

(Illustration by GGS Information Services/Thomson Gale.)

1980. Originally Medifast was primarily a medically-supervised weight loss program. Medifast still offers this option, but only about 10% of its customers now utilize the diet under mandatory medical supervision. Currently an individual can access the the Medifast diet program through Hi-Energy Weight Loss Centers, at home by telephone or through the web site ([www.medifastdiet.com](http://www.medifastdiet.com)), through hospitals or clinics, or through the office of a health care provider (for example, a physician, nutritionist, or dietitian). Medifast is available in Asia (India, Hong Kong, and Singapore) as Dr. Diet.

## Description

Glucose is generally regarded as the preferred energy source for cells in the body, with ketosis being regarded as the crisis reaction of the body to a lack of **carbohydrates** in the diet. In a diet that does not substantially contribute to blood glucose, the body goes through a set of stages to enter ketosis. After about 48 hours the body starts using ketones produced from stored **fats** for energy, releasing free fatty acids, while reserving glucose for important needs, thus avoiding the depletion of the body's stored **protein** in the muscles. The burning of fat is thought to provide sufficient levels of energy while helping to eliminate physical hunger. Ketosis can be deliberately induced through the use of a low-calorie, low-carbohydrate diet, such as the Medifast diet, resulting in rapid weight loss due to the use of body fat for energy.

Specifically, the Medifast diet is a weight loss program that relies on meal replacement food products that are purchased from Jason Pharmaceuticals. Although medical supervision of the Medifast diet is

not required, it is recommended. There are over 50 different meals that a dieter may choose as part of the diet, including shakes, bars, drinks, oatmeal, chili, soups, and puddings. The daily calorie intake on the plan is between 800 to 1,000 calories per day. During the weight loss phase of the diet, the dieter follows a 5 & 1 meal plan that consists of five portion-controlled, nutritionally-balanced Medifast meals plus one Lean & Green meal. The Lean portion of the Lean & Green meal consists of either:

- five ounces of cooked lean beef, pork, or lamb
- seven ounces of cooked chicken, turkey, fish, or seafood.

The Green portion of the Lean & Green meal consists of:

- Two cups of salad greens with 1/2 cup of raw vegetables (cabbage, spinach, sprouts, celery, radishes, cucumber, pepper, or tomato and 1-2 tablespoons of low-carb salad dressing, or
- One and one-half cups of low-carbohydrate cooked vegetables (Carrots, corn, peas, potatoes, and Brussels sprouts should be avoided during the weight loss phase of the Medifast diet).

A person who chooses to replace all meals with Medifast food products and to not incorporate the Lean & Green meal into their diet must do so only under a doctor's supervision.

During the Medifast 5 & 1 weight loss phase, the dieter eliminates fruits, dairy, and starches because of their high carbohydrate content. These foods can be reintroduced into the diet during the maintenance phase of the Medifast program. The dieter is also directed to drink at least 64 ounces of **water** per day and to limit the intake of other non-caloric liquids,

## KEY TERMS

**Acesulfame potassium** —A calorie-free artificial sweetener, also known as Acesulfame K or Ace K, and marketed under the trade names Sunett and Sweet One. Acesulfame potassium is 180-200 times sweeter than sucrose (table sugar), as sweet as aspartame, about half as sweet as saccharin, and one-quarter the sweetness of sucralose. Like saccharin, it has a slightly bitter aftertaste, especially at high concentrations. Kraft Foods has patented the use of sodium ferulate to mask acesulfame's aftertaste. Alternatively, acesulfame K is often blended with other sweeteners (usually sucralose or aspartame)

**Transient ischemic attack (TIA)** —A neurological event with the signs and symptoms of a stroke, but which go away within a short period of time. Also called a mini-stroke, a TIA is due to a temporary lack of adequate blood and oxygen (ischemia) to the brain. This is often caused by the narrowing (or, less often, ulceration) of the carotid arteries (the major arteries in the neck that supply blood to the brain). TIAs typically last 2 to 30 minutes and can produce problems with vision, dizziness, weakness or trouble speaking

**Deep vein thrombosis (DVT)**—Blockage of the deep veins; particularly common in the leg.

**Premenstrual syndrome (PMS)**—A syndrome that involves symptoms that occur in relation to the menstrual cycle and which interfere with the woman's life. The symptoms usually begin 5 to 11 days before the start of menstruation and usually stop when menstruation begins, or shortly thereafter. Symptoms may include headache, swelling of ankles, feet, and hands, backache, abdominal cramps or heaviness, abdominal pain, bloating, or fullness, muscle

spasms, breast tenderness, weight gain, recurrent cold sores, acne flare-ups, nausea, constipation or diarrhea, decreased coordination, food cravings, less tolerance for noises and lights, and painful menstruation

**Pulmonary embolism**—Lodging of a blood clot in the lumen (open cavity) of a pulmonary artery, causing a severe dysfunction in respiratory function. Pulmonary emboli often originate in the deep leg veins and travel to the lungs through blood circulation. Symptoms include sudden shortness of breath, chest pain (worse with breathing), and rapid heart and respiratory rates

**Pycnogenol**—Trade name of a commercial mixture of bioflavonoids (catechins, phenolic acid, proan, thocyanidins) that exhibits antioxidative activity

**Type 1 Diabetes**—Previously known as insulin-dependent diabetes mellitus, (IDDM) or juvenile diabetes. Type 1 diabetes is a life-long condition in which the pancreas stops making insulin. Without insulin, the body is not able to use glucose (blood sugar) for energy. To treat the disease, a person must inject insulin, follow a diet plan, exercise daily, and test blood sugar several times a day. Type 1 diabetes usually begins before the age of 3.

**Type 2 Diabetes**—Previously known as noninsulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes is the most common form of diabetes mellitus. About 90 to 95% of people who have diabetes have type 2 diabetes. People with type 2 diabetes produce insulin, but either do not make enough insulin or their bodies do not use the insulin they make. Most of the people who have this type of diabetes are overweight

although additional non-caloric beverages are allowed. Coffee and caffeinated drinks are limited to three per day, as the low caloric level of the Medifast diet may increase sensitivity to **caffeine**, resulting in anxiety or shakiness. Alcoholic beverages are not recommended on the Medifast program, as they provide additional calories without nutritional value. Alcohol also stimulates the appetite as well as depletes the body of water.

The protein used in Medifast meal products is **soy** protein, which as a complete protein, provides all of the essential amino acids required for nutrition. The benefits of soy protein include:

- potential lowering of blood cholesterol levels, especially levels of LDL cholesterol
- potential increase in the mineral content and density of bones, which may protect against bone fractures and osteoporosis
- possible prevention of hormone-related cancers such as breast cancer, prostate cancer, and colon cancer
- possible reduction in triglycerides and increase in HDL cholesterol
- possible reduction in menopausal symptoms, including hot flashes or night sweats

Different formulations of the Medifast shakes, Medifast 55 and Medifast 70, are used for men and women. All of the low-lactose shakes contain proteins, **vitamins**, and **minerals**. However, Medifast 70 has a higher soy protein content and is more suitable for men or for women who are physically very active. In addition, there is a Medifast Plus Shake for Appetite Suppression available that contains an appetite suppressant in addition to protein, vitamins, and minerals. There are also a variety of lactose-free or low-lactose products available for persons who are lactose-intolerant.

The dieter is allowed one snack a day on the Medifast diet. These snacks may be Medifast snacks purchased through the program or such items as celery stalks, sugar-free gelatin, sugar-free gum, sugar-free mints, bouillon, sugar-free popsicles, or dill pickle spears. Medifast products are sweetened with fructose or acesulfame potassium. Medifast diet products do not contain any stimulants, ephedrine, or herbs. Additional vitamin supplements are not required with the Medifast program, as the Medifast meals are fortified with vitamins. There are about 3-4 grams of **fiber** in most Medifast meal replacement products. Only one Medifast bar is allowed per day on the diet, as the bars are higher in calories than the other Medifast food products. Meals can be seasoned with herbs, seasonings, or spices, but the use of condiments such as ketchup, mustard, soy or teriyaki sauce, vinegar, horseradish is limited to small amounts of not more than 3-4 condiments a day. To accommodate eating at restaurants while still adhering to the Medifast diet, the dieter can have the daily Lean & Green meal.

For persons with various allergies, Medifast provides information on allergens present in specific Medifast food products. These allergens include whey, milk, soy, lactose, wheat, eggs, shellfish, tree nuts, peanuts, caffeine, and gluten.

All Medifast food products meet the standards imposed by the United States Food and Drug Administration for standards, labeling, and packaging requirements for the marketing and sale of medical foods, vitamins, and nutritional products. As part of the medical **food labeling** requirement, each product lists the name and quantity of each ingredient and is identified as a weight management/modified fasting or fasting supplement. The majority of Medifast products are certified kosher by The Orthodox Union of New York. In addition, there are a number of vegetarian meals and snacks available. A vegetarian can replace the meat portion of the Lean & Green meal with such items as low fat cheese, eggs or egg substitute, tofu, cottage cheese, or vegetable burgers.

There are several specialized Medifast food products and supplements that can be used in conjunction with the Medifast 5 & 1 diet program. However, individuals should not incorporate more than one kind of supplement into their Medifast meal plan.

Medifast Plus for Diabetics is designed to meet the nutritional needs of persons with Type 2 diabetes. This Medifast program can be used as a supplement in a weight-loss program for a person with Type 2 diabetes or as a supplement to a diabetes diet that has been designed to control blood sugar. The Medifast food products for diabetics contain less than 5 grams of sugar per serving, and many of the products have been certified as Low Glycemic by the Glycemic Research Institute. Blood sugar, oral diabetes medications, and insulin needs must be monitored periodically and adjusted as needed. Blood sugar should be checked at least two to three times a day, especially at the beginning of the Medifast program.

Medifast Plus for Joint Health is a meal-replacement supplement that was formulated to relieve the symptoms associated with arthritis and poor joint health. Medifast Joint Health Shakes contain both **glucosamine** and chondroitin. Three Joint Health Shakes are included daily as part of the Medifast 5 & 1 Meal plan. A person who is already taking medication for arthritis should consult with their health care provider before incorporating Joint Health shakes into their Medifast diet plan.

Medifast Plus for Women's Health is a meal-replacement supplement that was formulated to relieve and prevent the symptoms of menopause, such as hot flashes and night sweats. The Women's Health Shakes contain black cohosh, **echinacea**, and chaste tree berry. One to three Women's Health Shakes are included daily as part of the Medifast 5 & 1 meal plan. A woman who is already on Hormone Replacement Therapy should consult with their health care provider before incorporating Joint Health shakes into their Medifast diet plan.

Medifast Plus for Coronary Health is a meal replacement supplement that was formulated to protect the heart against disease. Coronary Health Shakes include Coenzyme Q10, amino acids, and Pycnogenol. One to three Coronary Health Shakes are included daily as part of the Medifast 5 & 1 meal plan. The Coronary Health Shake was designed as a preventive measure, and persons with concerns about their heart health should talk to their health care provider before using this Medifast food product. It is especially important that persons who are already on heart medications consult with their health care provider

before incorporating Coronary Health shakes into their Medifast diet plan. In addition, dosage levels of blood pressure medications may need to be adjusted as a person loses weight.

Exercise is an integral part of losing weight and maintaining weight loss. However, a person who does not have an exercise program in place prior to starting the Medifast diet should wait 2-3 weeks before beginning an exercise program, in order to prevent **dehydration** and to protect muscle tissue. A person who does participate in an exercise program before starting the Medifast diet should cut the exercise program in half for the first several weeks, to allow the body to adjust to the lower calorie levels. As the body adjusts, the length and intensity of exercise can be increased.

A person stays on the Medifast 5 & 1 plan until:

- the target weight has been met
- weight loss has slowed to less than three pounds per month
- the dieter develops a contraindication to the program, such as pregnancy
- the health care provider recommends transitioning into the maintenance phase

If a person has significant weight to lose that necessitates staying on the weight loss phase for longer than sixteen weeks, the program should be monitored by a health care provider.

During the transition phase, after the weight loss phase of the Medifast diet, calories are slowly added back into the diet to give the body time to adjust to the new levels of calories and carbohydrates. Following the transition phase, an individual should develop a plan to maintain the weight loss. In some cases, a person may choose to continue to include Medifast food products in conjunction with other low calorie meals to maintain a healthy weight. Persons experiencing a weight gain of five to ten pounds may go back on the Medifast 5 & 1 plan for a few weeks in order to return to their target weight.

As of 2007, the Medifast diet costs about \$10/day, \$70/week, or \$275/month when purchasing food in packages. Costs are higher when purchasing on a per-product basis. There are no enrollment or membership fees associated with the program. The Medifast program has a web-based support program for customers that provides the dieter with tools, support, and information to assist with nutrition, exercise, and motivation. The program provides also behavior modification programs. In August 2002 Jason Pharmaceuticals set up a health network subsidiary, Take Shape for Life, that by 2007 had enrolled over 150

physicians and medical professionals to supervise a network of qualified health advisors who work with individuals to help them successfully implement their Medifast diet plan.

## Function

The purpose of the Medifast diet is create a calorie deficit that allows a person to burn fat and lose weight while maintaining muscle mass. The Medifast diet is most suited for those persons who need to lose a significant amount of weight and have had difficulty losing weight with other diets.

## Benefits

Many people on the Medifast diet lose an average of 2-5 pounds per week. Individual results vary based on initial weight when starting the program, targeted weight-loss goal, level of exercise, presence of medical conditions, use of medications, and compliance with the diet requirements.

## Precautions

Before starting the Medifast diet program, a person should consult with a health care provider. This is especially important if the person:

- has any serious medical conditions
- is on any medications, especially those for diabetes
- is age 65 or older
- is under the age of 18
- has 50 pounds or more to lose.

All individuals taking prescription medications should periodically meet with their health care provider while on the Medifast diet to make sure that medication dosages while on the diet. Persons over the age of 70 must be under the supervision of a health care provider when using the Medifast diet. These older people may need a higher caloric intake and may need to adjust their dosages of medications.

The Medifast meals should be eaten every two to three hours. If a meal is missed, the rest of the meals should be eaten closer together, for if a meal is skipped, the nutrients for the day will be inadequate.

There may be difficulties associated with transitioning from a diet based on shakes and soups to a regular diet. The transition phase should last about four to six weeks and can be started by introducing foods such as oatmeal for breakfast and fruits for snacks. Due to the low level of caloric intake during the weight loss phase of the Medifast diet, it is likely that some muscle loss will occur, so gradually

increasing strength training during the transition phase is recommended.

### Risks

Certain conditions absolutely prohibit the use of a low calorie diet such as Medifast. These conditions include:

- Myocardial infarction/heart attack within previous three months, unstable angina
- Strokes or transient ischemic attacks
- Uncontrolled seizures
- Clotting disorders
- Type 1 diabetes (unless Medifast food products are used to improve nutrition or weight maintenance, but Medifast is not recommended as a weight loss program for Type 1 diabetics)
- Severe liver or kidney diseases that require low-protein diets
- Active peptic ulcer disease
- Active cancers
- Active thrombophlebitis (or Deep Vein Thrombosis (DVT)/Pulmonary Embolism (PE) within three months
- Pregnancy or breast-feeding
- Eating disorders such as anorexia or bulimia
- Severe psychiatric illnesses, including history of major depression and/or suicide attempts
- Corticosteroid therapy of greater than 20 mg per day
- Chronic illicit drug use, addictions, alcoholism, and/or substance abuse.

Other conditions may limit the use of Medifast products and require the close supervision of a health care provider. These conditions include:

- Use of the medication Lithium (blood lithium levels should be monitored during the use of the Medifast diet)
- A history of seizures
- A history of peptic ulcer disease
- Use of anticoagulant medications such as coumadin (blood tests should be performed to determine the therapeutic level of coumadin required during the use of the Medifast diet)
- Over the age of 70 (it is recommended that persons use Medifast products in conjunction with a 1,200 calorie per day diet)
- Adolescent use (after puberty and under the age of 18, the Medifast diet should only be used under the care of a health care provider)

- Hypothyroidism (the Medifast diet should only be used under the direct supervision of the health care provider. Blood tests should be conducted throughout the period of the diet and medication adjusted as required. Some health care providers suggest that a non-soy Medifast product be eaten at the time of day that the thyroid medication is taken. .
- Gastric by-pass surgery (the Medifast diet can be used in conjunction with gastric bypass surgery but calorie levels may be adjusted at the recommendation of the health care provider.

Many people do not experience physical discomfort on the Medifast program. However, some persons may become constipated, feel dizzy, lightheaded, fatigued, and/or cold, and may develop dry skin and hair. Other effects may include leg cramps, headaches, hair loss, rashes, gas, diarrhea, bad breath, and excessive feelings of hunger. For women, the rapid weight loss associated with the Medifast diet may cause an increase in levels of estrogen in the blood stream, which can affect the regularity of menstrual cycles, possibly increase symptoms of premenstrual syndrome (PMS), and can also increase fertility.

### Research and general acceptance

More than 15,000 physicians in the United States have recommended Medifast programs to their patients, and more than a million persons have used the Medifast diet since 1980. The Medifast diet is most suitable for persons who need to lose a significant amount of weight. The Medifast diet can be effective, but as with all diets, relapses are common. To maintain the weight loss, the use of a fitness routine is recommended to increase **metabolism** and lean muscle mass. The Medifast diet can also be expensive, especially when on-going medical oversight is included.

The Johns Hopkins Weight Management Center in Baltimore, Maryland uses Medifast food products for their very low calorie diets. In a clinical study, researchers at Johns Hopkins found that males lost an average of 67.41 pounds and females lost an average of 47.5 pounds after being on the Medifast program for six weeks.

In an 86-week weight loss study of persons with Type 2 diabetes, which was funded by Medifast, researchers from Johns Hopkins Bloomberg School of Public Health found that participants using Medifast lost twice as much weight and were twice as compliant as participants following a standard food diet based on the **dietary guidelines** of the American Diabetes Association (ADA). Twenty-four percent of the Medifast dieters were able to decrease or eliminate

## QUESTIONS TO ASK YOUR DOCTOR

- Is this type of low calorie diet appropriate for my weight-loss needs?
- What types of medical monitoring and oversight do I need?
- Where can I find support and information?
- What types of side effects should I watch out for?

their diabetes medication, compared to zero percent on the standard ADA food diet.

As of 2007, the National Institutes of Health is sponsoring a study on energy metabolism in the post-obese state at The University of Vermont. Medifast products are being used as the weight loss tool in the study. The study found that after 8 months, participants lost 45–65 pounds. Other users of the Medifast diet include the Shands Teaching Hospital, which is affiliated with the University of Florida, as part of their adolescent **obesity** treatment program and the Maine State Prison in their weight-loss program for obese prisoners.

### Resources

#### BOOKS

Davis, Lisa, and MacDonald, Bradley, T. *The Secret is Out: Medifast, What Physicians Have Always Known About Weight Loss*. Owings Mill, Maryland: Medifast, Inc., 2006.

#### ORGANIZATIONS

Medifast, Inc. Telephone: 800-209-0878. Website: [www.medifast1.com]

Tish Davidson, A.M.

## Mediterranean diet

### Definition

The Mediterranean diet is better described as a nutritional model or pattern of food consumption rather than a diet in the usual sense of the word. To begin with, there is more than one Mediterranean diet, if the phrase is understood to refer to the traditional foods and eating patterns found in the countries bordering the Mediterranean Sea. Francesco Visioli, a researcher who has edited two books on the subject,

prefers the term “Mediterranean diets” in the plural to reflect the fact that “the populations in the Mediterranean area have different cultures, religions, economic prosperity, and [levels of] education, and all these factors have some influence on dietary habits and health.” For example, Visioli notes that alcohol intake is very low in the Maghreb (coastal northwestern Africa) because most inhabitants of the region are Muslim, and consequently cereal grains figure more prominently in their diet than in most other Mediterranean countries. In addition, the differences among the various forms of the Mediterranean diet are important in understanding some of the research studies that have been done on it, as will be described more fully below.

### Origins

The origins of the pattern of food consumption found in Mediterranean countries go back several millennia into history; descriptions of meals in ancient Greek and Roman literature would not be out of place in contemporary Mediterranean diet cookbooks. The first description of the traditional Mediterranean diet as it was followed in the mid-twentieth century, however, was not in a cookbook; it was in a research study funded by the Rockefeller Foundation and published in 1953. The author was Leland Allbaugh, who carried out a study of the island of Crete as an underdeveloped area. Allbaugh noted the heavy use of olive oil, whole-grain foods, fruits, fish, and vegetables in cooking as well as the geography and other features of the island.

The Cretan version of the Mediterranean diet became the focus of medical research on the Mediterranean diet following the publication of Ancel Keys’s Seven Country Study in 1980. Keys (1904–2004) was a professor of physiology at the University of Minnesota who had a varied background in biology and biochemistry before turning to nutrition almost by accident. Hired by the Army in 1941 to develop portable rations for troops in combat, Keys was responsible for creating what the Army then called K rations. His next wartime project was a starvation experiment, which he conducted in order to determine the food needs of starving civilians in war-torn Europe. American soldiers who were trying to re-feed refugees in the newly liberated countries found that there was no reliable medical information about treating starvation victims. Keys recruited 36 healthy male volunteers in 1944 who were conscientious objectors, most of them from the historic peace churches. For five months the subjects were given half the normal calorie requirement of an adult male and asked to exercise regularly on a treadmill. The average weight loss was 25% of body