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Critical Issue Report: That First Step

That First Step: Organic Food and a Healthier Future

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It's hard to overestimate the importance of this report, exploring practical ways to start turning the tide on some of our most urgent health issues.

When I started in pediatric practice, it was unusual to see a child with high blood pressure, high blood glucose, high triglycerides, low HDL, and/or increased waist size of 38 inches or more. These were all conditions of middle age. Together, these major heart disease risk factors make up metabolic syndrome, an important concept explored in this report.

Stunningly, today about two-thirds of U.S. teens already have at least one of these middle age conditions, according to a study of almost 2,000 children aged 12 to 19 (de Ferranti et al., 2004). About 1 in 3 of all overweight or obese kids age 12 to 19 already have full-blown metabolic syndrome. Not only is it harder for these children to exercise, it's harder for them to lose weight even if they do. It's far better and easier to prevent insulin resistance than to treat it. Still, those kids who have already developed metabolic syndrome need focused help today to prevent a downward spiral that will only worsen with time. For the reasons explained in this report, those with metabolic syndrome are at very high risk for developing unhealthy arteries, heart disease, and Type 2 diabetes.

In the recent past, Type 2 diabetes was called adult-onset diabetes because this obesity-related condition was also a problem of the middle-aged and the elderly. It usually takes years of unhealthy eating to tip someone into this type of diabetes. It was rarely seen before age 30 or even 40.

Sadly, today we do see Type 2 diabetes in children. A family I saw last week had a 10-year-old who already had it. Pediatricians across the country are having similar experiences. But until a recent significant study none of us knew exactly how large the problem had become.

A huge study of millions of kids revealed for the first time the true extent of Type 2 diabetes in children in the United States. The results appeared in the June 27, 2007 *Journal of the American Medical Association* (*JAMA, 2007*). Today 22 percent of all diabetes diagnosed in US children is Type 2. And in kids aged 10-19, Type 2 diabetes was more common among some groups of kids than Type 1 (previously called juvenile diabetes)

The message is clear: Overweight, obesity, and diabetes are among our nation's most urgent health problems. It's time to feed our kids healthy amounts of healthy foods and to ensure that they get a liberal dose of active play every day. This important report goes a step further and explores six mechanisms by which organic food and farming can give the added edge we need to slow and reverse the rise of these profound problems.

Beyond this, it has been my experience for myself, my family, and for many families I work with, that choosing organic food is indeed the first step on a path toward a healthier lifestyle. Paying attention to the food that goes in our bodies is an excellent place to start.

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EXECUTIVE SUMMARY

Organic food and farming can help slow, and potentially reverse the rising incidence of overweight, obesity, and diabetes through six principal mechanisms.

Starting Out

Three of these mechanisms are grounded in the human reproductive cycle. In the months before a child is conceived, during fetal growth, and through adolescence, a well-balanced diet composed of ample organic fruits and vegetables, and dairy and grain products will:

1. Promote healthy patterns of cell division and differentiation, and lay the groundwork for normal endocrine system regulation of blood sugars, lipids, energy intake, and immune system functions.

2. Establish and help sustain taste-based preferences in the child for familiar nutrient-dense, flavorful foods.

3. Largely eliminate dietary exposures to approximately 180 pesticides known to disrupt the development or functioning of the endocrine system.

An expecting mother's diet just before and during pregnancy directly controls the adequacy of the nutrients available to the developing embryo and fetus and also plays a major role in determining how many toxic chemicals are present in amniotic fluids, and whether the levels approach those capable of blocking normal development.

Changes in the embryo and during fetal development can lead to abnormal patterns of cell differentiation and gene expression. These sorts of changes are called epigenetic, and entail deviant gene expression patterns that alter the developmental and health trajectories of individuals, without altering underlying DNA.

Mounting evidence links exposure to endocrine disrupting chemicals, including dozens of pesticides, to epigenetic changes that predispose a person to face, later in life, the challenges of living with overweight, obesity, and diabetes. In addition, science has now convincingly proven that, in the case of epigenetics and human development:

The timing of exposures is just as important, and in some cases more important than the dose levels delivered to the developing embryo and fetus.

In 1993 when Dr. Theo Colborn and colleagues published the first list of endocrine disrupting chemicals, it contained 35 pesticides representing about 20 percent of the commercially important pesticide products at that time. An updated 2009 list provided by Dr. Colborn includes 180 pesticide active ingredients. Well over half the important pesticides used by farmers in the U.S. and globally are on the list. Most Americans are exposed to four to seven of these chemicals on a near-daily basis.

The Rest of Life

During adolescence and adulthood, and as we age, nutrient-dense, organic foods high in phytochemicals can contribute to weight management and prevention of diabetes, while also lessening or delaying the complications linked to both. Organic food and farming may help do so by:

4. Possibly helping to trigger or reinforce a sense of satiety, or fullness, thereby reducing excessive caloric intake.

5. Lessening or limiting the cellular and genetic damage done by reactive oxygen species (so-called free radicals), and in this way reducing the risk of diabetes and other diseases rooted in inflammation (arthritis, cardiovascular disease) and rapid cell growth (cancer).

6. Slowing, and perhaps even reversing certain neurological aspects of the aging process, leading to better memory and retention of cognitive skills.

One phytochemical in particular – resveratrol – has captured the attention of scientists and the food industry. This stilbene, a polyphenolic activator of a key regulatory protein, mimics the effects of calorie restriction in lower organisms. Moreover, the most potent analogue of resveratrol has actually reversed neurological aging in animal studies, leading some to wonder if resveratrol is the source of the mythical "Fountain of Youth."

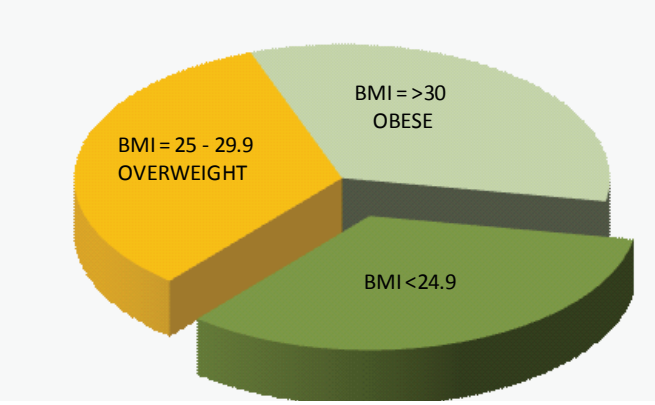
Several studies have shown that organic farming enhances resveratrol levels in red grapes by, on average, about 30 percent. Conventional farming can do the opposite. One study focused on five Muscadine grape cultivars managed using a typical, nine-spray fungicide disease control program, in contrast to an organic system. In one variety, the harvested grapes that were sprayed with fungicides contained one-fifth the concentration of resveratrol, compared to the grapes from vines under organic management. The resveratrol levels in the organic grapes grown from two other cultivars were about three-fold higher.

In this study, the ability of the organic grape vines to fight off the adverse impacts of plant pathogens through biosynthesis of resveratrol was nearly comparable to vines treated nine times with fungicides.

Higher levels of dietary intakes of certain phytochemicals have also been shown to help preserve sensitivity to insulin, a key step in preventing pre-diabetes from progressing to full-fledged diabetes.

In helping manage blood glucose levels and promoting cardiovascular health, organic food and farming delivers benefits in two important ways. It exposes people to fewer of the endocrine disrupting chemicals that can set off the disease process and trigger epigenetic changes, and second it delivers higher daily intakes of health-promoting phytochemicals that reinforce the body's defense and repair mechanism.

Scope of the Challenge



Weight distribution of U.S. adults (CDC)

The magnitude of this problem is unmistakable and immense. About one-third of adults 20 to 74 years of age in the United States are obese (Body Mass Index[1] ≥ 30) and another third are overweight (BMI 25.0 to 29.9). The Centers for Disease Control and Prevention (CDC) reports that the number of obese people (about 34 percent) now outnumber those who are overweight (about 33 percent).

Overweight and obesity are also rising among children, setting the stage for far more cases of Type 2 diabetes, and cases that strike earlier in life, leaving more time for the insidious complications of diabetes to erode well being and drive up health care costs.

If current obesity trends continue, by the year 2030, experts expect that over 85 percent of adults will be overweight or obese, and over one-half will be obese. In fact, if current trends are not successfully altered, all Americans would be overweight or obese by 2048.

Diabetes is a serious condition associated with overweight and obesity. The CDC reported that the rate of new diabetes cases nearly doubled over the last decade, reaching 9.1 new cases per 1,000 persons between 2005 and 2007.

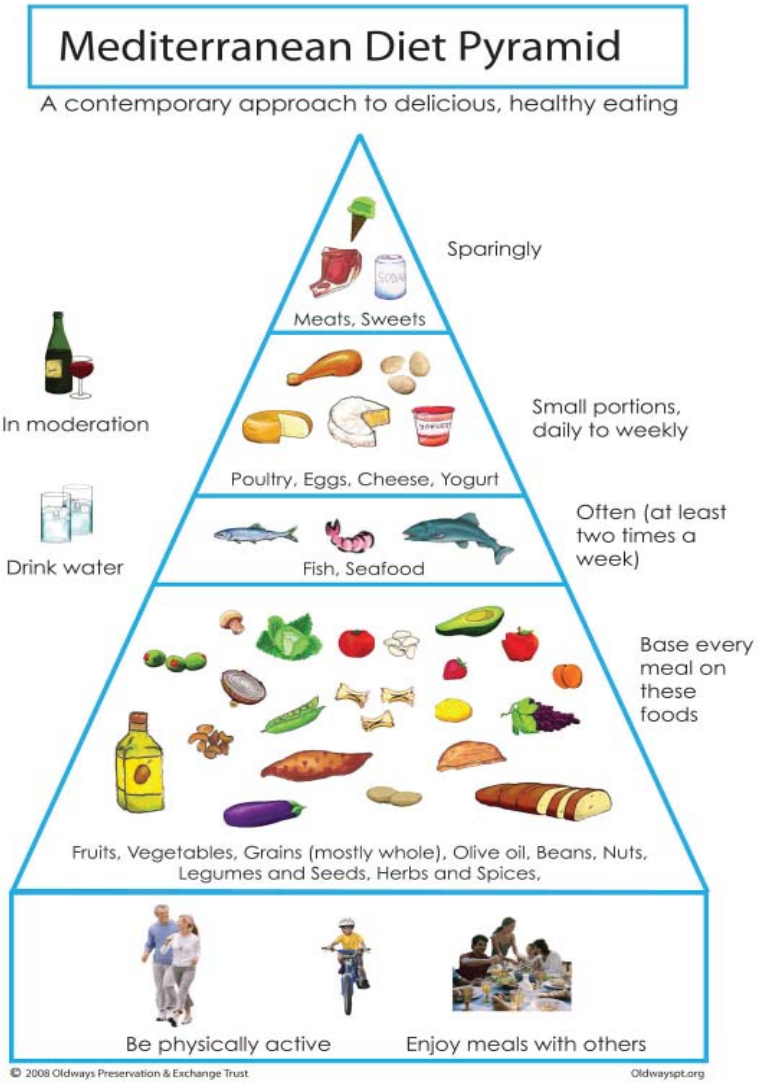
Total health care costs attributed to obesity/overweight and their complications are projected to double every decade to nearly $1 trillion in 2030, accounting for 16-18 percent of total U.S. health care costs.

Turning the Tide

The upward trend in overweight, obesity, and diabetes must be stopped and then reversed in order to offer any hope that the health and longevity of the baby-boomer generation will equal that of the previous generation. Achieving this goal is a public health, fiscal, and human imperative.

Clearly, no silver bullet will get this job done. There will be no single pill or medical breakthrough, no unique change in policy or education programs, no diet, nor a revolution across the food industry that will turn the tide on overweight, obesity, and diabetes. Substantial changes will be required in all these arenas. While the secret to success will differ across individuals, substantial and sustained progress depends, most fundamentally, on changing people's attitudes and behaviors about food, exercise, and balancing food energy intakes to not exceed food calories burned.

[1]Body Mass Index (BMI) is calculated by dividing an individual's body weight in kilograms by the square of his or her height in meters.



The good news is that relatively modest changes in exercise and food consumption patterns could dramatically alter the trajectory of current trends, especially among young people and those moving toward, but not yet into the overweight zone. A net reduction in excess caloric intake of 100 to 200 calories per day would, according to some experts, stop the progression to overweight among as many as 90 percent of Americans.

Most adults ingest 2000 to 2500 calories daily. Accordingly, a 5 percent to 10 percent reduction in caloric intake would get the average person at least halfway to the goal line. Accomplishing such a reduction could be achieved by cutting back on portion size by three or four bites during a meal, drinking an 8 ounce glass of water instead of a 12 ounce soda, or replacing a sweetened, energy-dense dessert with a serving of fresh fruit.

Burning an extra 100 calories a day is not a daunting task for most Americans. Walking for an extra 15 minutes a day, or about 2,000 to 2,500 steps, gets the job done for most people, as would walking up three flights of stairs instead of riding the elevator, growing a garden, riding a bike, walking the dogs or bowling. The list goes on.

Other steps in the right direction are described at the end of both Chapters 1 and 4. Practical and proven steps include: emphasizing — and enabling — sound dietary choices in food and nutrition programs and policies, including access to fresh, local and organic produce and organic dairy products.

A shift toward a Mediterranean diet (see figure on this page) would also benefit many Americans, as discussed in Chapter 4. The evidence is strong that eating more foods from the bottom of this contemporary Mediterranean diet "pyramid" will deliver health benefits.

Maternity leave policy in the U.S. should include economic incentives (e.g., paid maternity leave) so that women need not choose between careers, keeping food on the table and what is best for their newborn children.

Such policies are already the norm in most other developed countries in the world. This change in policy is acutely needed for non-affluent women and women with inflexible work schedules.

It is also important to point out what won't work. For people now consuming too many calories and making poor dietary choices, switching to organic versions of the same foods will do little good in combating overweight and diabetes. People engaging in unhealthy lifestyles, or who are under merciless stress and lack adequate sleep, may experience some improvements in health from switching to organic food, but major improvements will likely be constrained by these other negative factors.

The First Step is the Most Important

We have drawn upon over one-hundred fifty scientific studies in this report in describing six mechanisms through which organic food and farming can undermine, to one degree or another, the factors leading to ever-higher rates of overweight and diabetes in the United States. We must conclude, however, by acknowledging there is essentially no peer-reviewed science exploring or documenting what may be the most important mechanism of all.

Reams of consumer research show that the conscious decision by an individual to first seek out and purchase organic food is usually motivated by a personal desire to improve one's own health and/or the health of family members.

Forging a new relationship with food is ***the*** critical first step that every dietitian, doctor, educator, and concerned friend is searching for as they interact with a person headed toward or already contending with overweight and diabetes.

We see anecdotal evidence in the nutrition education literature and consumer surveys that the decision to start purchasing organic food is often the first of an incremental series of steps that change in progressively deeper ways a person's attitudes and behaviors toward food, diet, and health.

Even if it reaches only a segment of society, this is a trajectory of change that is worth supporting in every way possible, since the exact nature and order of steps taken by people establishing new and healthier relationships with food matters less than steady and sustained progress along this path.