

NEW FINDINGS FROM THE NURSES' HEALTH STUDY

The

# Fertility Diet



Groundbreaking Research Reveals  
Natural Ways to Boost Ovulation & Improve  
Your Chances of Getting Pregnant

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# Foreword

"Does my diet affect my chances of getting pregnant?"

That's a question I am asked all the time. Sometimes it comes from women grappling with infertility, other times from healthy women who are hoping to become pregnant. Although I have always answered in the affirmative, I haven't been able to base my answer on strong scientific evidence. Now I can.

Groundbreaking research from the Nurses' Health Study indicates that various components of diet, from fats to beverages, can help women avoid one of the most common causes of infertility—problems with ovulation, the carefully timed release of an egg from the ovary. This research, led by Drs. Jorge Chavarro and Walter Willett of the Harvard School of Public Health, lays the foundation for a dietary plan for fertility and beyond.

In *The Fertility Diet: Groundbreaking Research Reveals Natural Ways to Boost Ovulation and Improve Your Chances of Getting Pregnant*, Drs. Chavarro and Willett review the previously limited scientific evidence linking diet with fertility and present compelling findings on this connection from the Nurses' Health Study. They explain how (and why) "good" fats, whole grains, and plant protein help guard against ovulatory infertility, while "bad" fats, refined carbohydrates, and red meat may contribute to it. They make the case that full-fat dairy products seem to be good for fertility, while skim milk and sugared sodas aren't.

Adopting any one of the ten steps the book recommends is a great start. Following more of them appears to be even better. Among the women in the Nurses' Health Study, those who followed five or more of the Fertility Diet strategies reduced their risk of ovulatory infertility by 80 percent to 90 percent. That's a substantial reduction achieved with a set of simple, inexpensive, and tasty dietary changes.

Throughout the book, Drs. Chavarro and Willett provide specific, practical advice about how to adjust your diet to improve fertility. A weeklong sample diet and recipes help translate this advice into practice. An additional bonus is that the diet they recommend is good for both a healthy pregnancy and a lifetime of healthy eating.

Other books have provided advice on diet and fertility. But none of them is based on the wealth of evidence provided by the Nurses' Health Study. And none of them comes from scientists with the stature of the authors of *The Fertility Diet*. Dr. Willett's contributions to the field of human nutrition have been so important that he is one of the most cited scientists in the world. The scientific publications by Drs. Chavarro and Willett and their colleagues on nutrition and fertility will undoubtedly bolster this impressive achievement and, more important, should lead the way to a new understanding of the sometimes obvious, sometimes subtle, connections between diet and reproduction.

A long list of problems can lead to infertility. A couple whose infertility stems from blocked fallopian tubes or low sperm production isn't likely to be helped by changes in diet and lifestyle. That's one reason why it makes sense to see a specialist if you are having trouble getting pregnant. That said, the two most common impediments to pregnancy are problems with ovulation and

infertility for which no obvious cause can be found. For these, lifestyle changes that include an optimal diet, appropriate levels of exercise, reducing unnecessary stress, and eliminating exposure to nicotine can improve fertility.

A great paradox of modern medicine is that powerful and invasive high-tech approaches to infertility, such as in vitro fertilization, are widely available and highly effective for quickly achieving pregnancy. But they aren't the only solution. For many women who want to become pregnant, low-tech approaches such as optimizing diet and lifestyle can significantly improve fertility and lead to pregnancy. Common sense suggests that this is the place to start. *The Fertility Diet* provides a map that guides couples toward diet and lifestyle choices that can make a real difference in fertility.

Robert L. Barbieri, M.D.

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# Acknowledgments

If many hands make light work, then the task of creating this book was featherlike. First and foremost, we would like to thank the participants of the Nurses' Health Study, especially the women in the fertility study. The information they have shared about their reproductive experiences, as well as about their diets and lifestyle choices, is the source of the new findings on diet and fertility described in this book. We also want to thank the members of the Nurses' Health Study research team, who routinely take mountains of seemingly random data and translate them into coherent pictures. In particular, we would like to acknowledge the special contributions of Janet Rich-Edwards, Sc.D., and Bernard Rosner, Ph.D., key members of the Nurses' Health Study research team, who helped us formulate many of the questions explored in our diet-fertility studies and then understand the answers.

We would be remiss if we did not acknowledge the support of the National Institutes of Health, which has provided important research funding for the Nurses' Healthy Study for many years. We very much appreciate the strong public support for health research in the United States and hope that the information in this book represents a good return on investment.

We also want to thank Robert Barbieri, M.D., chief of obstetrics, gynecology, and reproductive biology at Brigham and Women's Hospital, for reviewing the manuscript and ensuring that nutritional epidemiologists accurately presented the biology of reproduction, what can go wrong, and how nutrition may affect fertility.

We are indebted to our colleagues at Harvard Health Publications who helped take this book from idea to print. Editor-in-chief Anthony L. Komaroff, M.D.; chief editor for books Julie K. Silver, M.D.; and managing editor Nancy Ferrari provided valuable editorial guidance. Associate editor Raquel Schott kept us on track, especially in her coordination of figures and tables. Art director Heather Derocher and graphic design intern Merika Ficheux helped craft the illustrations that grace the book. At McGraw-Hill, editors Judith McCarthy and Julia Anderson Bauer smoothly ushered the book from conception to production.

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**Jorge Chavarro:** I would like to thank my wife, Amy, for her support and encouragement throughout the research I did into possible links between diet and fertility. Who could have known that what began as a relatively small research project would grow into a book like this? I also want to acknowledge my daughter, Isabella, who was born during the writing of this book. I hope that the strategies described in *The Fertility Diet* will help many couples experience the kind of intense joy that Isabella has brought to our lives.

**Walter Willett:** I would like to thank my wife, Gail, for her support and tolerance of the many nights and weekends demanded by a research and writing career.

**Pat Skerrett:** I am forever grateful for the love, support, and encouragement that daily comes my way from my wife, Helen Dájer, and our children, Michael, Helen Claire, and Peter. Thanks for letting me take over the dining room table with infertility papers and for fighting my tunnel vision with baseball, dancing, and nighttime reading.



# Chapter 1

## Nourishing the Miracle of Conception

Conception, that frantic meeting between egg and sperm, is a fragile miracle. So many things must happen in just the right order that it would seem to be improbable. Yet it happens, thank goodness, all by itself, millions of times a year. For one in seven American couples, though, conception doesn't "just happen."<sup>1</sup> Something thwarts the rendezvous between sperm and egg. The list of these somethings is long, ranging from eggs that don't mature properly to blocked fallopian tubes and weak-swimming sperm. Physical, physiological, and hormonal barriers to conception mean baby making can take much longer than expected or not happen at all.

Many couples keep trying, and hoping, and worrying. Others turn to the burgeoning medical industry that has bloomed in the last couple decades to get around barriers to conception. Medications that rev up egg production along with an alphabet soup of reproductive procedures—IVF, GIFT, ZIFT, ICSI, and others—have helped more than a million couples have babies.

These medical approaches aren't perfect. They lead to a viable pregnancy only about one-quarter of the time. They are time consuming and invasive. They can have unwanted side effects. Many couples would rather not turn to technology for something as intimate and personal as conceiving a child. Others simply can't afford it.

High-tech medicine isn't the only answer.

New research from the Nurses' Health Study, one of the largest and longest-running studies of women's health in America, shows that what you eat, how active you are, and other lifestyle choices can stack the reproductive deck in your favor, especially if trouble with ovulation—the maturation or release of a mature egg each month—is at the root of your problems conceiving.

It is common knowledge that what you eat and how you live affect the health of your heart and blood vessels, your chances of developing certain kinds of cancer, your eyesight, the strength of your bones, and more. It only makes sense that diet and health affect the ability to get pregnant and stay pregnant. After all, reproduction is just one of many systems in the body, all of them subject to similar rules and influences.

What is astonishing is that this is news. While millions upon millions of dollars have been spent developing and perfecting reproductive technologies, almost no attention has been paid to connections between diet and fertility. This oversight speaks volumes about medicine in America—a laserlike focus on drugs, devices, or procedures that can generate revenue and often total disregard for self-help measures that anyone can do for free.

## Ten Steps to Improving Your Fertility

Farmers, ranchers, and animal scientists know more about how nutrition affects fertility in cows, pigs, sheep, chickens, and other commercially important animals than fertility experts know about how it affects reproduction in humans. To be sure, hints are scattered across medical journals. But there have been few systematic studies of this crucial connection in people.

We set out to change this sad state of affairs with the help of more than eighteen thousand female nurses from all across the United States. These women are part of the Nurses' Health Studies, which we describe in "Knowledge from Nurses." They have provided information on their health, including pregnancies, miscarriages, and infertility, along with detailed records of their diets, physical activity, smoking habits, and other practices. All told, the women in the fertility study have contributed more than eighty million bits of data. From this vast mine of information, we have discovered ten simple changes that offer a powerful boost in fertility for women with ovulation-related infertility. These are:

1. Avoid trans fats, the artery-clogging fats found in many commercially prepared products and fast foods.
2. Use more unsaturated vegetable oils, such as olive oil or canola oil.
3. Eat more vegetable protein, like beans and nuts, and less animal protein.
4. Choose whole grains and other sources of carbohydrate that have lower, slower effects on blood sugar and insulin rather than highly refined carbohydrates that quickly boost blood sugar and insulin.
5. Drink a glass of whole milk or have a small dish of ice cream or full-fat yogurt every day; temporarily trade in skim milk and low- or no-fat dairy products like cottage cheese and frozen yogurt for their full-fat cousins.
6. Take a multivitamin that contains folic acid and other B vitamins.
7. Get plenty of iron from fruits, vegetables, beans, and supplements but not from red meat.
8. Beverages matter: water is great; coffee, tea, and alcohol are OK in moderation; leave sugared sodas unopened.
9. Aim for a healthy weight. If you are overweight, losing between 5 and 10 percent of your weight can jump-start ovulation.
10. If you aren't physically active, start a daily exercise plan. If you already exercise, pick up the pace of your workouts. But don't overdo it, especially if you are quite lean—too much exercise can work against conception.

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## **KNOWLEDGE FROM NURSES**

More than thirty years ago, researchers hoping to answer a vitally important question—Do birth control pills have long-term health effects?—proposed a bold study. They would survey thousands of female nurses about their methods of birth control and then track their health over time. Little did they know that this study would evolve into one of the largest investigations of how diet, lifestyle, social, and biological factors affect the risk of developing heart disease, cancer, diabetes, osteoporosis, and other chronic conditions.

The researchers, from the Harvard School of Public Health, chose nurses for several reasons. Because of their knowledge and training, nurses could be counted on to provide accurate, reliable

health information. Equally important, as health professionals, they are extremely aware of the value of medical research and have traditionally been willing to make long-term commitments to studies.

That commitment was evident from the get-go. The study started in 1976 with more than 120,000 married, female nurses between the ages of thirty and fifty-five years. Each completed a two-page questionnaire. Since then, these women have loyally filled out ever-expanding questionnaires every two years, asking about what they eat and how much they exercise, about work and stress, and about other personal matters such as social relationships and caregiving. They also provide detailed reports about the state of their health.

A second round of the Nurses' Health Study was started in 1989 by one of us (Dr. Willett) to explore reproductive and other health issues that couldn't be answered by the original study. It includes 116,000 younger women who also complete detailed questionnaires every other year.

This book is based on research conducted in a specially selected group of women from this second group. To help understand how diet affects fertility, we identified 18,555 participants who said on one of the biennial surveys that they were trying to get pregnant. None had previously reported problems with infertility. Over the next eight years, these women reported nearly 27,000 "pregnancy attempts." That doesn't mean 27,000 acts of intercourse (which would make this one of the most undersexed groups of women in America), but 27,000 efforts to get pregnant that lasted from a few weeks to more than twelve months. Most were successful. Slightly more than 3,400 of the women (13 percent of all attempts) had difficulty becoming pregnant, including hundreds who experienced ovulatory infertility.

Thanks to these women and the personal information they willingly provided, we have been able to investigate connections between diet and fertility. We hope that these dedicated nurses' efforts, which are embodied in this book, will help other women prevent or overcome ovulatory infertility.

You can learn more about the Nurses' Health Studies, and even see the questionnaires the study participants complete, by visiting the study's website, [[link:www.nurseshealthstudy.org](http://www.nurseshealthstudy.org)].

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We didn't mention smoking. Only a small number of women in the Nurses' Health Study are smokers, which made it impossible for us to examine in detail its effects on fertility. We didn't really need to, though. Scads of solid studies have established that women who smoke take longer to get pregnant on their own or with assisted reproduction and are more likely to miscarry than nonsmokers.<sup>2</sup> So we'll add an eleventh recommendation: if you smoke, stop.

You may think that you've heard advice like this before. There are a few infertility diet books in circulation, and the Internet is rife with dietary advice for women who want to get pregnant. These are scattershot approaches based on wishful thinking and what seems like common sense. Our recommendations, on the other hand, are based on evidence from one of the most comprehensive long-term studies ever conducted.

At least for now, these recommendations are aimed at preventing and reversing ovulatory infertility. They may work for other types of infertility, but we don't yet have enough data to explore connections between nutrition and infertility due to other causes. Because the Nurses'

Health Study doesn't include information on the participants' partners, we weren't able to explore whether nutrition affects male infertility. From what we have gleaned from the limited research in this area, some of the Fertility Diet strategies might improve fertility in men, too.

## Good for All

These ten tips work on many levels. They are simple. They cost a few dollars at most. They don't have side effects, with the possible exception of twins, as we describe in "Double Take." They are available to everyone, not just those with good health insurance. Best of all, they are every bit as good for your long-term health—and your partner's—as they are for improving fertility. In fact, a diet built around these strategies will serve you well all through pregnancy and into old age.

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### DOUBLE TAKE

The ovaries are programmed to release one mature egg each cycle. Something goes awry with this process in up to one-quarter of couples who have trouble getting pregnant. Some women with ovulatory infertility have trouble making mature eggs. Others don't release them at the right time. One option is the use of fertility drugs such as clomiphene (Clomid) or injections of follicle-stimulating hormone or luteinizing hormone (Pergonal, Fertinex, and others) that ramp up the ovaries' production of eggs. The usual result of these drugs is the release of multiple mature eggs.

The changes we advise in the Fertility Diet improve ovulation, though in a less dramatic way. It is possible that even this gentler stimulation may prompt the ovaries to make and release more than one egg every so often. If both get fertilized, you could go from no children to two in a heartbeat.

As one of us (Skerrett) knows firsthand, twins can be a blessing. But they can also pose health risks to each other and their mother. Women carrying twins are more likely to develop gestational diabetes or preeclampsia than women carrying a single child. Twins tend to arrive earlier, with almost half of all twins born prematurely.<sup>3</sup> They can limit each other's growth, and fetal death is more common with twins.

Those are the possibilities. The reality is that most women carrying twins have safe, uneventful pregnancies and deliver two healthy children.

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## Using This Book

In the chapters that follow, we lay out how and why each of the ten steps affect fertility and offer tips for putting them into practice. [Chapter 13](#) helps you plan a week's worth of meals and snacks and includes fifteen recipes that incorporate our pregnancy-promoting recommendations.

You can use these strategies on their own to increase your chances of becoming pregnant. If you are pursuing assisted reproduction, they offer easy ways to boost the chances it will succeed.

We wish we could guarantee that following the Fertility Diet strategies will lead to a pregnancy. But we can't do that any more than a doctor can guarantee you will have a baby following IVF, GIFT, or any other assisted reproduction procedure. And we can safely say that the Fertility Diet strategies won't work for couples who are having trouble getting pregnant because the woman has

blocked fallopian tubes or the man's ejaculate is devoid of active sperm cells.

That said, for couples plagued by ovulatory infertility, and possibly other types as well, following our diet, exercise, and weight recommendations increases the odds of conceiving *and* sets the stage for a healthy pregnancy. And over the long term, these changes will benefit your heart, your brain, and the rest of your body.

That's a winning combination, no matter how you look at it.

# Chapter 2

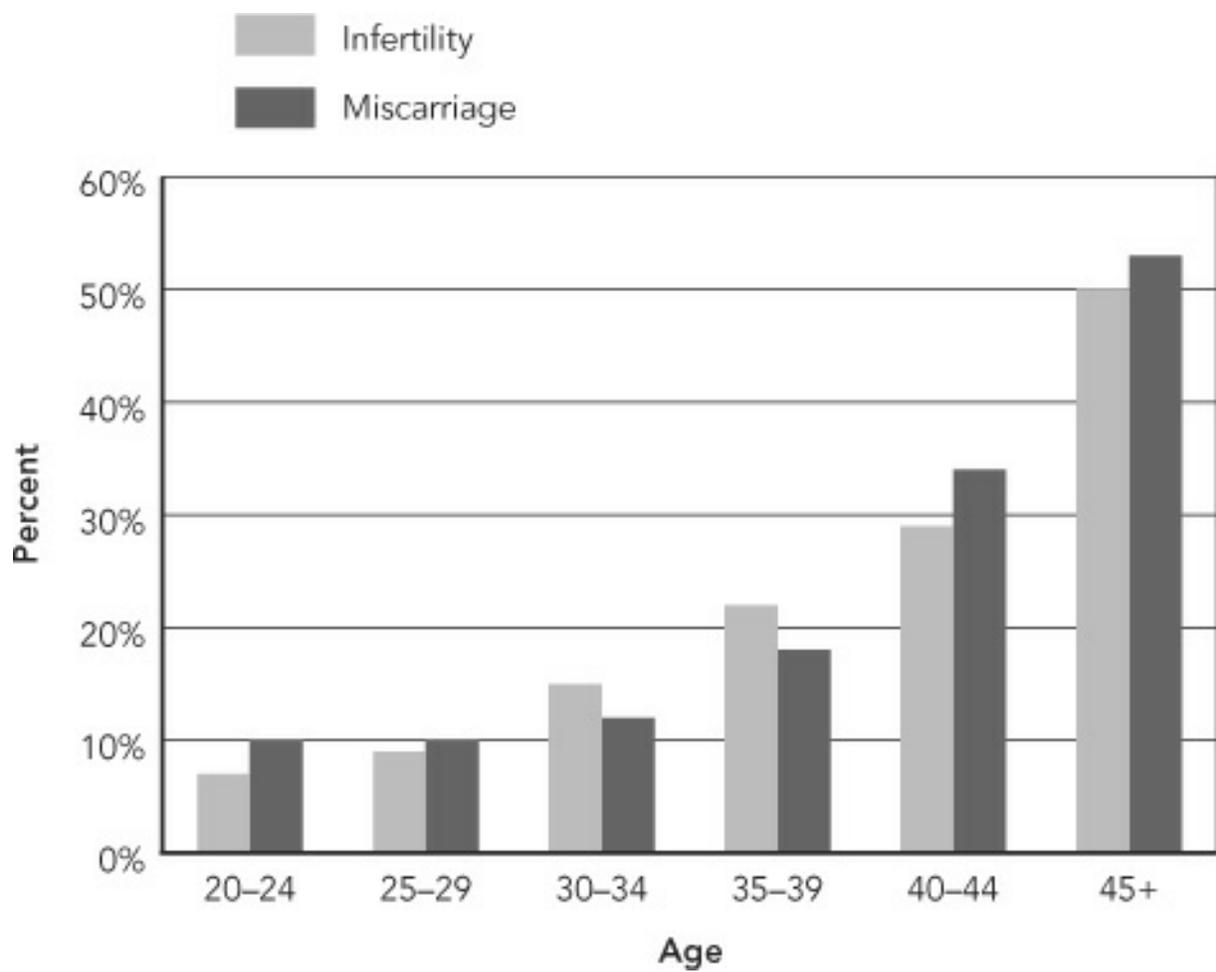
## Missed Conceptions

Every new life starts with two seemingly simple events. First, an active sperm burrows into a perfectly mature egg. Then the resulting fertilized egg nestles into the specially prepared lining of the uterus and begins to grow.

The key phrase in that description is "seemingly simple." Dozens of steps influenced by a cascade of carefully timed hormones are needed to make and mature eggs and sperm. Their union is both a mad dash and a complex dance, choreographed by hormones, physiology, and environmental cues.

Given the complexity of conception, it's no wonder that infertility has beset couples for as long as they have been trying to have children. In ancient Egypt, infertility was common enough and public enough for the Egyptians to have a popular goddess of infertility, named Nephtys.<sup>1</sup> The biblical story of Sarah's desperate quest for a child, which finally ended with the birth of Isaac when she was ninety, is a tale of infertility, hope, disbelief, and divine intervention. Through the ages, healers and frauds have come up with various remedies for infertility, ranging from poultices of nettles and potions of mare's milk and rabbit blood to electrically charged beds guaranteed to bless their users with progeny.

Today, an estimated six million American couples have trouble conceiving. Age is one factor. Many couples delay having a baby until they are financially ready or have established themselves in their professions. Waiting, though, decreases the odds of conceiving and increases the chances of having a miscarriage, as [Figure 2.1](#) shows. Sexually transmitted diseases such as chlamydia and gonorrhea, which are on the upswing, can cause or contribute to infertility. The linked epidemics of obesity and diabetes sweeping the country have reproductive repercussions. Environmental contaminants known as endocrine disruptors appear to affect fertility in women and men. Stress and anxiety, both in general and about fertility, can also interfere with getting pregnant.



The longer a couple waits to have a child, the longer they may wait to have a child. Fewer than 10 percent of women in their early twenties have issues with infertility, compared to nearly 30 percent of those in their early forties and half or more of those over age forty-five. Miscarriage also becomes **[End of Sample]**