

May 8, 1990

Huge Study Of Diet Indicts Fat And Meat

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The study can be considered the Grand Prix of epidemiology. Sixty-five hundred Chinese have each contributed 367 facts about their eating and other habits that could ultimately help them and Americans preserve their health and prolong their lives. The data alone fill a volume of 920 pages, to be published next month by Cornell University Press. Among the first tantalizing findings are these: Obesity is related more to what people eat than how much. Adjusted for height, the Chinese consume 20 percent more calories than Americans do, but Americans are 25 percent fatter. The main dietary differences are fat and starch. The Chinese eat only a third the amount of fat Americans do, while eating twice the starch. The body readily stores fat but expends a larger proportion of the carbohydrates consumed as heat. Some of the differences may be attributable to exercise. The varying levels of physical activity among the Chinese were measured, but the data have not yet been analyzed.

Reducing dietary fat to less than 30 percent of calories, as is currently recommended for Americans, may not be enough to curb the risk of heart disease and cancer. To make a significant impact, the Chinese data imply, a maximum of 20 percent of calories from fat - and preferably only 10 to 15 percent - should be consumed.

Eating a lot of protein, especially animal protein, is also linked to chronic disease. Americans consume a third more protein than the Chinese do, and 70 percent of American protein comes from animals, while only 7 percent of Chinese protein does. Those Chinese who eat the most protein, and especially the most animal protein, also have the highest rates of the "diseases of affluence" like heart disease, cancer and diabetes.

A rich diet that promotes rapid growth early in life may increase a woman's risk of developing cancer of the reproductive organs and the breast. Childhood diets high in calories, protein, calcium and fat promote growth and early menarche, which in turn is associated with high cancer rates. Chinese women, who rarely suffer these cancers, start menstruating three to six years later than Americans. Dairy calcium is not needed to prevent osteoporosis. Most Chinese consume no dairy products and instead get all their calcium from vegetables. While the Chinese consume

only half the calcium Americans do, osteoporosis is uncommon in China despite an average life expectancy of about 70 years, just five few years less than the American average.

These findings are only the beginning. Dr. T. Colin Campbell, a nutritional biochemist from Cornell University and the American mastermind of the Chinese diet study, predicts that this "living laboratory" will continue to generate vital findings for the next 40 to 50 years.

The study, started in 1983 to explore dietary causes of cancer, has been expanded to include heart, metabolic and infectious diseases. Dr. Chen Junshi of the Chinese Institute of Nutrition and Food Hygiene organized the survey to cover locations from the semitropical south to the cold, arid north.

Exacting, Labor-Intensive Study

The extensive volume of raw data and its counterpart on computer tape will be available to any scientist to use as raw material for medical research.

It is an exacting, labor-intensive study, initially financed by the National Cancer Institute, that probably could not have been done anywhere except China. For nowhere else can accurate mortality statistics be combined with data from people who live the same way in the same place and eat the same foods for virtually their entire lives.

Nowhere else is there a genetically similar population with such great regional differences in disease rates, dietary habits and environmental exposures. For example, cancer rates can vary by a factor of several hundred from one region of China to another. These large regional variations in China highlight biologically important relationships between diet and disease.

And nowhere else could researchers afford to hire hundreds of trained workers to collect blood and urine samples and spend three days in each household gathering exact information on what and how much people eat, then analyzing the food samples for nutrient content.

'The Whole Diet Panoply'

"The total cost in U.S. dollars of this project - \$2.3 million plus 600 person-years of labor contributed by the Chinese Government - is a mere fraction of what it would have cost to do the same study here," Dr. Campbell noted. And unlike typically circumscribed American studies that examine one characteristic as a factor in one disease, the Chinese investigation "covers the whole diet panoply as it relates to all diseases."

Dr. Mark Hegsted, emeritus professor of nutrition at Harvard University and former administrator of human nutrition for the United States Department of Agriculture, said: "This is a very, very important study - unique and well done. Even if you could pay for it, you couldn't do this study in the United States because the population is too homogeneous. You get a lot more meaningful data when the differences in diet and disease are as great as they are in the various parts of China."

In the first part of the study, 100 people from each of 65 counties throughout China each contributed 367 items of information about their diets, lives and bodies. The responses from residents of each county were then pooled to derive countywide characteristics that could be measured against the area's death rates for more than four dozen diseases.

By matching characteristics, researchers derived 135,000 correlations, about 8,000 of which are expected to have both statistical and biological significance that could shed light on the cause of some devastating disease.

In the poorer parts of China, infectious diseases remain the leading causes of death, but in the more affluent regions, heart disease, diabetes and cancer are most prominent, Dr. Campbell said.

Adding Taiwan to the Research

Although from an overall perspective of nutrient composition the Chinese diet is more health-promoting than ours, he said, there are some important limitations that result from a lack of economic development.

"Food quality and variety are not as good as ours," he explained. "With limited refrigeration, bacteria and mold contamination is more common, large amounts of salt and nitrites are used to preserve foods and hot spices are used to mask off-flavors."

The study is now being expanded and revised. New mortality rates are being gathered to update the original mortality data from the early 1970's and to reflect causes of death for 100 million people in the late 1980's. The original 6,500 participants are being resurveyed and people from 12 counties in Taiwan are being included in the expanded survey, which will also measure many socioeconomic characteristics.

"We want to see how economics change and health factors follow," Dr. Campbell explained in an interview. "Taiwan should be interesting because it is intermediate between the United States and China in nutrient intake and plasma cholesterol levels. And since the Taiwanese gene pool is more like the Chinese, we can study the relative contributions of genetics and diet to risk of disease."

Cholesterol as Disease Predictor

Dr. Campbell continued: "So far we've seen that plasma cholesterol is a good predictor of the kinds of diseases people are going to get. Those with higher cholesterol levels are prone to the diseases of affluence - cancer, heart disease and diabetes."

Contrary to earlier reports that linked low blood cholesterol levels to colon cancer, the Chinese study strongly suggests that low cholesterol not only protects against heart disease but also protects against cancer of the colon, the most common life-threatening cancer among Americans. In China, mortality rates from colon cancer are lowest where cholesterol levels are lowest.

Over all, cholesterol levels in China, which range from 88 to 165 milligrams per 100 milliliters of blood plasma, much lower than those in the United States, which range from 155 to 274 milligrams per 100 milliliters of plasma.

"Their high cholesterol is our low," Dr. Campbell noted. He said the data strongly suggest that a major influence on cholesterol levels and disease rates is the high consumption of animal foods, including dairy products, by Americans.

'Basically a Vegetarian Species'

"We're basically a vegetarian species and should be eating a wide variety of plant foods and minimizing our intake of animal foods," he said.

The Chinese have already begun to capitalize on these findings, using them to develop national food and agricultural policies that will promote health.

"Usually, the first thing a country does in the course of economic development is to introduce a lot of livestock," Dr. Campbell said. "Our data are showing that this is not a very smart move, and the Chinese are listening. They're realizing that animal-based agriculture is not the way to go."

The plant-rich Chinese diet contains three times more dietary fiber than Americans typically consume. The average intake in China is 33 grams of fiber a day, and it ranges as high as 77 grams in some regions. Dr. Campbell found no evidence to suggest that diets very high in fiber are in any way deleterious to nutritional well-being.

While American scientists worry that fiber may interfere with the absorption of essential minerals like iron, no reason for concern was found among the Chinese. Rather, those with the highest fiber intake also had the most iron-rich blood.

Iron From Vegetables

The study also showed that consumption of meat is not needed to prevent iron-deficiency anemia. The average Chinese adult, who shows no evidence of anemia, consumes twice the iron Americans do, but the vast majority of it comes from the iron in plants.

Nor are animal products needed to prevent osteoporosis, the study showed. "Ironically," Dr. Campbell noted, "osteoporosis tends to occur in countries where calcium intake is highest and most of it comes from protein-rich dairy products. The Chinese data indicate that people need less calcium than we think and can get adequate amounts from vegetables."

Another common health concern that could prove to be a red herring is the fear that aflatoxin, which is produced by a mold that grows on peanuts, corn and other grains, causes liver cancer. Rather, the Chinese study strongly indicates that chronic infection with hepatitis B virus and high serum cholesterol levels are the primary culprits.

"We did not find any relationship between aflatoxin and liver cancer, and we have the largest study on this question ever done," Dr. Campbell said.

Among other intriguing findings are a relationship between infection with herpes simplex virus and coronary heart disease and a relationship between infection with the yeast candida and nasopharyngeal cancer.

"Lots and lots such relationships are turning up as we plot out the 367 characteristics on maps of China and try to match them up with maps of disease rates," Dr. Campbell said. "The data now need to be interpreted, and six Chinese scientists are working with us on this. The amount of information gathered in this study is kind of staggering," he said, then proceeded to outline his interest in gathering more.