

The Department of Statistics and Applied Probability  
Presents

Raymond J. Carroll  
*Measuring Diet*

Tuesday, March 14, 2006



Raymond J. Carroll is a Distinguished Professor of Statistics, Nutrition, Toxicology & Epidemiology and Biostatistics at Texas A&M University. He is the Director of the Bioinformatics Training Program and Core Director of the Center for Environmental and Rural Health

Newspaper articles routinely report the results of epidemiological studies of the relationship between what we eat and disease outcomes such as heart disease and various forms of cancer. One of the most-quoted studies is the Nurses Health Study, which follows the health outcomes of 100,000 nurses and asks them questions about their dietary intakes. While there are exceptions, for the most part one can find a relationship between heart disease and diet, e.g., less fat, more fruits, etc. On the other hand, it is rare that prospective epidemiological studies of human populations find links between cancer and dietary intakes. Perhaps the most controversial of all is the question of the relationship between dietary fat intake and breast cancer. Countries with higher fat intakes tend to have higher rates of breast cancer, and yet no epidemiological study has shown such a link. The puzzle of course is to understand the discrepancy.

Obviously, the etiology of disease may explain why heart disease, with its intermediate endpoints such as serum cholesterol, has confirmed links to nutrition while the evidence is mixed with cancer. I will focus instead on a basic question of study design: how do we measure what we eat? Try this out: how many days per year do you eat pizza? I am going to review the accumulating evidence that suggests that with complex, subtle disease such as cancer, with no good intermediate endpoints such as serum cholesterol for heart disease, finding links between disease and nutrient intakes will be the exception rather than the rule, simply because of the way diet is measured.

The talk will touch briefly on the recently-completed Women's Health Initiative Dietary Intervention Study, and describe statistical reasons why this study might have been difficult to interpret even had it achieved statistical significance.

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