Risk of High Blood Pressure May Be Increased with Grilling and Other High-temperature Cooking

Preliminary research in a recent study has found that among people who routinely eat meat, chicken and fish, those who grill, broil or roast these foods at high temperatures may be more likely to develop high blood pressure. This research was shown in an AHA poster presentation by Gang Liu, Ph.D., a postdoctoral research fellow in the Department of Nutrition at the Harvard T.H. Chan School of Public Health, whose group analyzed cooking methods and the development of high blood pressure in people who regularly ate beef, poultry or fish. Liu’s study included 32,925 women taking part in the Nurses’ Health Study; 53,852 women participating in the Nurses’ Health Study II; and 17,104 men in the Health Professionals Follow-Up Study. Detailed cooking information was collected in each of these long-term studies. None of the participants had high blood pressure, diabetes, heart disease, or cancer when they enrolled, but 37,123 people developed high blood pressure during an average follow-up of 12-16 years.

Among participants who reported eating at least two servings of red meat, chicken or fish a week, the analysis revealed that the risk of developing high blood pressure was 17 percent higher in those who grilled, broiled, or roasted beef, chicken or and fish more than 15 times/month, compared with less than 4 times a month, and 15 percent higher in those who prefer their food well done, compared with those who prefer rarer meats. Researchers noted the relationship between cooking temperature, method, doneness and high blood pressure was independent of the amount or type of food consumed.

“The chemicals produced by cooking meats at high temperatures induce oxidative stress, inflammation and insulin resistance in animal studies, and these pathways may also lead to an elevated risk of developing high blood pressure,” said Liu. It is important to note that this study identifies a trend but does not prove cause and effect. “Our findings suggest that it may help reduce the risk of high blood pressure if you don’t eat these foods cooked well done and avoid the use of open-flame and/or high-temperature cooking methods, including grilling/barbequing and broiling,” Liu said.
This work was presented in a poster session at the AHA EPI/Lifestyle 2018 Scientific Sessions, March 20-23, New Orleans, LA (Presentation P184 – Session P02).


Also see:

Gang Liu, Geng Zong, Kana Wu, Yang Hu, Yanping Li, Walter C. Willett, David M. Eisenberg, Frank B. Hu, Qi Sun. Meat Cooking Methods and Risk of Type 2 Diabetes: Results from Three Prospective Cohort Studies. Diabetes Care. 2018 Mar; dc171992.

https://www.hsph.harvard.edu/news/hspfinthenews/grilling-high-temperature-cooking-high-blood-pressure/


https://news.heart.org/high-heat-cooking-overly-done-meat-high-blood-pressure-risk/


https://www.today.com/health/grilling-meat-may-raise-risk-high-blood-pressure-study-t125532

Adjunct Professor P.K. Newby to Publish New Book on Food and Nutrition

From gluten-free to all-Paleo, GMOs to grass-fed beef, our newsfeeds abound with nutrition advice. Whether sensational headlines from the latest study or anecdotes from celebrities and food bloggers, we’re bombarded with “superfoods” and “best ever” diets promising to help us lose weight, fight disease, and live longer. At the same time, we live in an over-crowded food environment that makes it easy to eat, all the time. In Food & Nutrition (Oxford University Press, 2018), Harvard- and Columbia-trained nutrition scientist, author, and gastronome Dr. P.K. Newby, Adjunct Associate Professor of Nutrition; Contit Ed/Spec Prog Instructor, examines 138 stand-alone questions addressing “need to know” topics, including how diet affects our health and environment, from farm to fork; the biology, psychology, and anthropology behind food choices; and evidence-based strategies for creating lasting behavior change, for life. At the same time, Newby debunks popular myths and food folklore, encouraging readers to “learn, unlearn, and relearn” the fundamentals of nutrition at the heart of a health-giving diet. Her passion for all things food shines through it all, as does her love of the power of science, technology, and engineering to help create healthier diets for ourselves, and a more sustainable future for the planet we share.

Food & Nutrition: What Everyone Needs to Know
By P.K. Newby, ScD, MPH, MS

Currently scheduling book signings and talks for September 2018 (US) and December 2018 (International). Contact pkn@pknewby.com for inquiries and availability.
Nutritional epidemiology has played an essential role in determining the relationship between diet and cardiovascular health. High-quality observational studies are necessary to continue building an evidence base to support nutrition policy and practice. However, when conducting nutritional epidemiologic studies, it is important to consider study design and methodological issues to avoid misleading conclusions. The recent Prospective Urban Rural Epidemiology (PURE) study (Dehghan et al., 2017) followed 135,000 participants in 18 countries for 7 years and concluded that high carbohydrate intake was associated with increased mortality risk while intake of total fat and individual types of fat was associated with decreased mortality risk. This study generated sensational headlines and a large media response, but the findings contradict previous evidence and may be subject to methodological problems. In response to this controversial study, Chinese colleagues Drs. An Pan and Xu Lin, along with Dr. Frank Hu and Elena Hemler from the Department of Nutrition, reviewed recent advances in epidemiologic study designs and evidence on the role of diet in cardiovascular health in the March 2018 issue of *Cell Metabolism*.

In the review, Pan et al. discuss study methodology in detail, highlighting prospective cohort studies as the preferred observational study design. While confounding and bias can never be completely eliminated in observational studies, they can be greatly reduced through appropriate study design and statistical methods. Integrating new diet assessment and precision nutrition tools into studies has provided additional evidence on the relationship between diet and health and will continue to rapidly advance the field of nutritional epidemiology. However, these new technologies are still developing and should complement traditional methods, not replace them.
The authors also review evidence on health effects of different types of dietary fats and carbohydrates, concluding that an emphasis on quality is imperative to reduce the global burden of cardiovascular disease. Types of carbohydrates differ in characteristics such as glycemic index, glycemic load, degree of processing and amount of dietary fiber, and therefore have divergent effects on disease risk. Similarly, types of fat such as polyunsaturated, monounsaturated, saturated and trans all affect cardiovascular health differently. When examining the relationship between diet and health, it is also important to consider the combined effects of dietary pattern, rather than just single foods or nutrients.

After providing the above context, Pan et al. point out a few methodological issues within the PURE study. For example, the study grouped all carbohydrates together, which may obscure the divergent effects of different types of carbohydrates (such as refined versus whole grains). Furthermore, the PURE study participants from low-income countries were subsisting on a very-high carbohydrate diet, which is often an indicator of poverty. Therefore, the association between carbohydrate intake and mortality was likely confounded by factors such as undernutrition, food insecurity and lack of access to medical care. In addition, the dietary intake data from the Chinese participants may not be reliable because it reported a much lower intake of fat than previous studies in China. Although this study was large and included participants from many countries, the findings should be interpreted with caution. Dr. Frank Hu, Professor and Chair of the Department of Nutrition, and senior author of the Cell Metabolism review, advises that it is important to understand the unique analytical and methodological issues in nutritional epidemiology when interpreting findings and making conclusions. “The main messages for nutritional advice have not changed: follow a healthy dietary pattern that includes abundant amounts of vegetables, fruits, whole grains, legumes, and nuts; moderate amounts of reduced-fat dairy products and seafood; and lower amounts of processed and red meat, sugar-sweetened foods and beverages, and refined grains.”

Read the full review here:

You can also read more about the Department of Nutrition’s response to the PURE study on the Nutrition Source.

PURE Study Reference:

MONDAY NUTRITION SEMINARS

The Department of Nutrition holds its weekly Monday Nutrition Seminar Series every Monday throughout the academic year. The talks are varied, but they highlight the many different aspects of cutting-edge research that is currently being conducted in the fields of nutrition and global public health. These seminars are held from 1:00-1:20 pm in Kresge 502 at the Harvard T.H. Chan School of Public Health. The seminars are free and open to the public.

The following speakers will discuss their work in April:

April 2  Dr Anna Herforth, Independent Researcher on Food Metrics; Co-founder of Agriculture-Nutrition Community of Practice (Ag2Nut). “Big data efforts in food systems and nutrition: Food affordability and diet quality”.

April 9  Dr Erin van Blarigan, University of California—San Francisco, TBD.
April 16 Dr Vasanti Malik, Research Scientist in Nutrition; Adjunct Lecturer in Nutrition, “Long-term Consumption of Sugar Sweetened and Artificially Sweetened Beverages and risk of Mortality in US adults”.

April 23 Dr Rina Agustina, Head of the Human Nutrition Research Cluster from the University of Indonesia, TBD.

April 30 Dr. Kirsten Davison, Donald and Sue Pritzker Associate Professor of Nutrition, HSPH, TBD.

VISITING SCIENTIST CARMEN SAYON-OREA INVESTIGATES ASSOCIATION BETWEEN EARLY BODY SHAPE TRAJECTORIES AND LATER RISKS OF MAJOR CHRONIC DISEASES

(By Hilary Farmer, Editor)

NN: Dr Sayon-Orea, could you please tell us a little about your academic background and where you are from?

CSO: I am from Mexico, but have been living in Spain for the last 10 years. I’m a Medical Doctor, and I have master degrees in Food Science, Nutrition and Metabolism, and Public Health, as well as a PhD in Public Health. Right now I’m a 4th year resident of Preventive Medicine and Public Health at Hospital Complex of Navarra in Spain and a post-doc fellow at the Department of Preventive Medicine and Public Health at the University of Navarra. My long-term research interests include the assessment of the risk factors associated with the development of obesity and some other chronic diseases such as the metabolic syndrome and hypertension. I have intensely participated as a researcher and lead author of articles in the SUN (Seguimiento Universidad de Navarra) project and the PREDIMED trial (Prevencion con Dieta Mediterranea).

NN: I understand you are a currently a visiting scientist in our Department of Nutrition, and working with Drs Frank Hu, Mingyang Song, and Dong Hang on the SUN cohort, using data from our NHS and HPFS cohorts. Could you describe the work you have been doing here at Harvard during your stay as a visiting scientist?

CSO: I came to Harvard to learn a novel statistical method which is the group-based trajectory modeling (GBTM) that was designed to empirically identify clusters of individuals following similar progressions of some behaviors or outcomes. Here at HSPH, using data from the NHS and HPFS cohorts, this methodology has been successfully used to demonstrate that body shape trajectories from early childhood to the ages of 50-60 were associated with risk of cancer, all-cause mortality, cardiovascular disease and type 2 diabetes. So in our Spanish cohort we want to start using this methodology, too.

NN: You are currently working on some papers describing the results of your study. What have you discovered so far?

CSO: The outcomes that we are studying now are the risks of hypertension, total mortality, and depression. We have already finished the first two analyses (hypertension and total mortality). Regarding hypertension risk, we found that among men and women who had a marked increase in body shape or who have maintained a heavy body shape during the lifespan were at higher risk of subsequently developing hypertension. Regarding mortality what we observed was that a moderate increase of body
weight in those who were already heavy at early life was associated with higher risk of morality compared
to those who maintained a medium body shape. And interestingly, we found that those who decrease
their body shape at early adulthood, and maintain a medium body shape thereafter were at lower risk of
total mortality. The results of these studies strengthen the importance of maintaining a healthy body
shape throughout the life span.

NN: You are very lucky to be in Boston at a time when we have weathered four major
Nor’easters in the month of March alone! What do you think of Boston weather? How do you
like Boston otherwise?

CSO: Hahahah, yes I’m very lucky! I never thought I was going to be witnessing one of the coldest fronts
in Boston during my stay; but overall I have enjoyed the views and the few sunny days we have had so
far. What I’ve seen around Boston is beautiful, and overall this has been a great personal and
professional experience for me. I look forward to visiting again and hopefully I won’t be this lucky with
cold weather and I hope to have a warmer front next time.

MORE NUTRITION IN THE NEWS

The Annual Student-Faculty Retreat was on March 2\textsuperscript{nd}. Despite the unfavorable, there was a good turnout.
Students presented on their work, along with a couple of Nutrition post docs. Students, Post Docs,
Research Scientists, and Faculty had time to learn about each other’s work and socialize. The winners of
the student presentation, voted on by all attendees, were: 1\textsuperscript{st} prize – Joshua Petimar – “Implementation
of Mediation Analysis for Nutritional Epidemiology”, and 2\textsuperscript{nd} prize – Allison Andraski – “Determine How
the Proteins on HDL Regulate HDL Function in Humans by Studying Their Distribution, Metabolism, and
Regulation by Diet.”

The grant application "Metabolomic Predictors of MS Outcomes" (PI: Alberto Ascherio; Co-PI:
Kassandra Munger), submitted to the Department of Defense , has been recommended for funding.

The R21 grant application, "Integrating diet, lifestyle and tumor tissue molecular subtyping to study the
role of adolescent calcium intake on the risk of early onset colorectal neoplasia” (Co-PIs (MPI, Prime
Harvard Chan): Kana Wu and Shuji Ogino) has received a fundable impact score (1\textsuperscript{st} percentile).

The R21 grant application, "Integrating diet and tissue whole exome sequencing data to study processed
meat and colorectal cancer” (Co-PIs (MPI, Prime Harvard Chan): Kana Wu and Reiko Nishihara)
received funding (impact score 2\textsuperscript{nd} percentile) starting 02/01/18.

Martha Tamez, Teaching Assistant, received the EPI Minority Travel Award on behalf of the American
Heart Association to attend the American Heart Association’s Epidemiology and Prevention/ Lifestyle and
Cardiometabolic Health 2018 Scientific Sessions in New Orleans, Louisiana on March 20-23, 2018. She
was acknowledged at the annual Joint Council Dinner at the conference.

Yang Hu (ScD candidate) and I (postdoctoral research fellow) has given an oral presentation at the AHA
EPI/Lifestyle 2018 Scientific Sessions, March 20-23, New Orleans, LA, titled “Smoking cessation and
subsequent risk of type 2 diabetes in three large prospective cohort studies of Americans”. Yang also won
the Early Investigator Travel Award.

Gang Liu (postdoctoral research fellow) also gave an oral presentation, titled “Adherence to a Healthy
Lifestyle in Relation to Cardiovascular Disease Incidence and Mortality Among Adults with Type 2
Diabetes”. In addition, Gang also had a poster presentation, titled "Meat Cooking Methods and Risk of
Hypertension: Results from Three Prospective Cohort Studies" at this conference,
The Nutrition Source

Superfood or Superhype?
There’s no scientifically-based or regulated definition of "superfood," so where did the term originate? [https://www.hsph.harvard.edu/nutritionsource/superfoods/](https://www.hsph.harvard.edu/nutritionsource/superfoods/)

Meat Cooking and Type 2 Diabetes

Food Feature: Oats
Oats are available in a variety of forms, based on their processing. Learn about the different types, oats and health, and how to cook with them. [https://www.hsph.harvard.edu/nutritionsource/oats/](https://www.hsph.harvard.edu/nutritionsource/oats/)

Always Delicious
In Always Delicious, the cookbook companion to Always Hungry?, Dr. David Ludwig teamed up with Chef Dawn Ludwig to create over 175 delicious and easy-to-make dishes. Interested in a taste? Try a sample recipe for yourself: [https://www.hsph.harvard.edu/nutritionsource/2018/03/05/always-delicious/](https://www.hsph.harvard.edu/nutritionsource/2018/03/05/always-delicious/)

Color the Kid’s Healthy Eating Plate
In celebration of #NationalNutritionMonth, the Kid’s Healthy Eating Plate is now available as a coloring page! Download the resource at: [https://www.hsph.harvard.edu/nutritionsource/kids-healthy-eating-plate/](https://www.hsph.harvard.edu/nutritionsource/kids-healthy-eating-plate/)

Also see the Monounsaturated Fats study: [https://www.hsph.harvard.edu/news/features/monosaturated-fat-heart-disease-risk/](https://www.hsph.harvard.edu/news/features/monosaturated-fat-heart-disease-risk/)

If you would like to remain current as to what is happening in the field of nutrition, please be sure to view our Nutrition Source website for the latest updates!

(See: [https://www.hsph.harvard.edu/nutritionsource/](https://www.hsph.harvard.edu/nutritionsource/))
NUTRITION HAPPENINGS AROUND HARVARD

DIVISION OF NUTRITION AT HARVARD
LONGWOOD NUTRITION SEMINAR 2017-2018

Medical Education Center, Harvard Medical School
260 Longwood Avenue, Cannon Room (Building C1) Boston, MA
12:00 – 1:00 PM 1st Tuesday of Month* (Lunch will be served at 11:30 AM)*

April 3, 2018
Hunter Pepin, RD,MS,CNSC
Brigham and Women’s Hospital
“Growth Patterns in Relation to Human Milk Intake in the NICU”

Supported by the Conrad Taff Educational Fund, Harvard Medical School and Mead Johnson Nutrition

For further information: contact Dr. Christopher Duggan or Barbara Ainsley @ 617-667-2604 christopher.duggan@childrens.harvard.edu or bainsley@bidmc.harvard.edu

To register: http://www.norch.org/center-events/2018-sugar/
For more information, please contact: cfredrickson@mgh.harvard.edu