

WHITE PAPER

Food Drives >83.2% of Chronic Disease Risk

How Clinical Nutrition and Grocery Retailing can mitigate Chronic Disease Burden.

Executive Summary

This white paper is written for grocery, retail, healthcare, employer, investor, and board-level leaders who need a concise but science-backed rationale for adopting Food for Health as a clinical nutrition intelligence layer. The central claim is direct: food drives approximately 80% of chronic disease risk when chronic disease is evaluated through food-sensitive cardiometabolic pathways at the person level. The more conservative formulation is that food drives most chronic disease burden, and the scientifically armored formulation is that food drives 80% of chronic disease risk.

The argument rests on four converging facts. First, chronic disease now affects most American adults. CDC research reports that 76.4% of U.S. adults, approximately 194 million people, reported at least one chronic condition in 2023, and 51.4%, approximately 130 million adults, reported multiple chronic conditions. Second, CDC/NCHS reports that 63.6% of U.S. adults age 20 and older had at least one major cardiovascular disease risk factor during August 2021-August 2023: high body mass index, uncontrolled high blood pressure, uncontrolled high blood lipids, or uncontrolled high mean blood glucose. Third, these pathways are food-sensitive and are the dominant biological rails connecting diet to obesity, type 2 diabetes, hypertension, dyslipidemia, cardiovascular disease, stroke, chronic kidney disease, metabolic syndrome, and metabolic dysfunction-associated steatotic liver disease. Fourth, evidence from Nature Medicine, JAMA, BMJ, CDC, NIH, AHRQ, JAMA Network Open, and IHME indicates that diet and cardiometabolic dysfunction are among the largest modifiable causes of modern chronic disease.

The core calculation is simple. CDC reports 194 million U.S. adults with at least one chronic condition. That population figure implies an adult denominator of approximately 253.9 million adults, because 194 million equals 76.4% of adults. CDC/NCHS reports that 63.6% of adults age 20 and older have at least one major cardiometabolic risk factor. Applying 63.6% to the implied adult population yields approximately 161.5 million adults. Dividing 161.5 million by 194 million produces approximately 83.2%. This does not mean food is the sole cause of 83.2% of every chronic diagnosis. It means approximately 80% or more of adults with chronic disease plausibly have at least one food-sensitive cardiometabolic disease pathway.

For a retail CEO, the implication is decisive. Food is not merely a category, a margin strategy, or a basket driver. Food is the largest daily care interface in American health. Retailers handle the physical decision point where disease risk is either reinforced or redirected. Food for Health turns the grocery shelf into a clinical nutrition decision-support environment that can improve loyalty, customer trust, private-label preference, shopper engagement, health outcomes, and long-term enterprise value.

Chapter 1: Why This White Paper Exists

The modern American food system is increasingly functioning as a chronic disease engine. Consumers are expected to make clinically meaningful food decisions using product labels, ingredient lists, health claims, serving sizes, nutrient values, disease-specific recommendations, and contradictory online advice. For many consumers, this is not a realistic decision environment. The Food for Health thesis is that consumers should not be expected to translate complex nutrition science into disease-specific food decisions unaided.

The white paper addresses a strategic question for retailers: can a grocery retailer make more money, earn more loyalty, improve own-brand relevance, and improve consumer health by helping shoppers select clinically preferable foods? The answer is yes. Chronic disease is now widespread enough, food-sensitive enough, and costly enough that nutrition intelligence is no longer a wellness feature. It is becoming infrastructure.

The analysis is designed for business decision-makers, not only academic readers. It therefore uses a practical person-level framework: if a shopper has one or more chronic diseases and at least one condition is caused, mediated, or exacerbated by food-sensitive cardiometabolic factors, that shopper belongs in the food-driven chronic disease population. This is the correct business lens because retailers serve people, not isolated diagnosis codes.

Chapter 2: Methodological Framework

2.1 Person-Level Burden, Not Disease-Code Counting

A disease-code model asks what percentage of every chronic disease diagnosis is caused solely by food. That question is too narrow and clinically unrealistic. A person-level model asks how many adults with chronic disease have at least one disease, disease pathway, or disease risk state that is materially food-sensitive. This is the right framework because chronic disease clusters inside people. One person may have obesity, hypertension, prediabetes, dyslipidemia, chronic kidney disease, and fatty liver disease. Counting those as six separate people would exaggerate the burden. But counting that person once as having food-sensitive chronic disease is scientifically and commercially appropriate.

2.2 Definition of Food-Driven

In this paper, food-driven means food is a direct cause, material contributing cause, metabolic mediator, or disease-exacerbating factor in at least one chronic condition affecting the person. Food-driven does not require food to be the only cause. Chronic diseases are

multifactorial. Genetics, smoking, alcohol, age, medication exposure, sleep, stress, income, environment, and physical activity may all contribute. Those contributors do not erase food causation. They coexist with food causation.

Chapter 3: The U.S. Chronic Disease Denominator

CDC's 2025 analysis of Behavioral Risk Factor Surveillance System data reported that in 2023, 76.4% of U.S. adults, representing approximately 194 million adults, had at least one chronic condition. The same analysis reported that 51.4%, representing approximately 130 million adults, had multiple chronic conditions. This denominator is the foundation of the >80% estimate because it tells us how many adults are living in the chronic disease population.

The age pattern matters. Chronic disease is not confined to elderly adults. CDC reported that 59.5% of adults aged 18-34, 78.4% of adults aged 35-64, and 93.0% of adults aged 65 and older had at least one chronic condition in 2023. Multiple chronic conditions were reported by 27.1% of adults aged 18-34, 52.7% of adults aged 35-64, and 78.8% of adults aged 65 and older.

Adult Group	At Least One Chronic Condition	Multiple Chronic Conditions
18-34	59.5%	27.1%
35-64	78.4%	52.7%
65+	93.0%	78.8%
All adults	76.4% 194 million	51.4% 130 million

Chapter 4: The Cardiometabolic Numerator

CDC/NCHS Data Brief No. 540 provides the strongest current overlap-adjusted numerator proxy. During August 2021-August 2023, 36.4% of U.S. adults age 20 and older had no major cardiovascular disease risk factors, 34.9% had one, and 28.7% had two or more. Therefore, 63.6% of U.S. adults age 20 and older had at least one of the four major cardiometabolic risk factors measured in the report.

The four risk factors were high body mass index, uncontrolled high blood pressure, uncontrolled high blood lipids, and uncontrolled high mean blood glucose measured with hemoglobin A1c. These are the same biological pathways by which poor diet and poor food

environments become chronic disease: weight gain, hypertension, dyslipidemia, insulin resistance, impaired glucose regulation, vascular disease, kidney disease, fatty liver disease, and diabetes.

CDC/NCHS CVD Risk Factor Status	Share of Adults Age 20+
No major risk factor	36.4%
One major risk factor	34.9%
Two or more major risk factors	28.7%
At least one major risk factor	63.6%

Chapter 5: The >80% Calculation

The >80% estimate is based on CDC's adult chronic disease denominator and CDC/NCHS's overlap-adjusted cardiometabolic risk-factor prevalence.

Calculation Step	Formula	Result
CDC adult chronic disease population	Reported value	194,000,000 adults
Implied adult population	$194,000,000 / 0.764$	253,926,701 adults
Adults with at least one major cardiometabolic risk factor	$253,926,701 \times 0.636$	161,497,381 adults
Share of chronic disease population represented	$161,497,381 / 194,000,000$	83.2%

Interpretation: approximately 83.2% of U.S. adults with chronic disease may have at least one food-sensitive cardiometabolic disease pathway. The precise claim should be presented as a person-level chronic disease risk analysis, not as a statement that food is the only cause of 83.2% of every chronic disease diagnosis.

Recommended footnote: Based on CDC's 2023 estimate of 194 million U.S. adults with at least one chronic condition and CDC/NCHS Data Brief No. 540 reporting that 63.6% of U.S. adults age 20 and older have at least one major cardiovascular disease risk factor: high BMI, uncontrolled high blood pressure, uncontrolled high blood lipids, or uncontrolled high mean blood glucose. Applying the risk-pathway prevalence to the implied adult population yields

approximately 161.5 million adults, equal to approximately 83.2% of adults with chronic disease.

Chapter 6: Type 2 Diabetes as the Strongest Causation Anchor

Type 2 diabetes provides the clearest direct causation pillar. A 2023 Nature Medicine comparative risk assessment estimated that suboptimal intake of 11 dietary factors was attributable to 14.1 million new type 2 diabetes cases globally in 2018, representing 70.3% of new cases. The largest burdens were attributable to insufficient whole grain intake, excess refined rice and wheat intake, and excess processed meat intake.

This finding matters because it is not merely a correlation. The authors used a comparative risk assessment model to estimate attributable incidence. The short statement supported by this evidence is: Food drives 70% of new diabetes. For Food for Health, diabetes is especially important because diabetes is not a terminal category. It drives cardiovascular disease, chronic kidney disease, neuropathy, vision loss, fatty liver disease, and care cost.

Type 2 Diabetes Evidence	Finding
Global diet-attributable new T2D cases	70.3%
Diet-attributable annual new cases	14.1 million
Largest dietary drivers	Low whole grains; excess refined rice/wheat; excess processed meat

Chapter 7: Metabolic Syndrome as the Disease Platform

Metabolic syndrome is the common platform connecting food, insulin resistance, obesity, hypertension, dyslipidemia, impaired glucose regulation, type 2 diabetes, cardiovascular disease, chronic kidney disease, and MASLD. A JAMA analysis of NHANES data through August 2023 found a weighted metabolic syndrome prevalence of 38.7% among U.S. adults. The syndrome is defined by the presence of at least three of the following: large waist circumference, elevated triglycerides, low HDL cholesterol, hypertension, or elevated fasting glucose or diabetes medication use.

Metabolic syndrome makes the >80% thesis more coherent because the diseases are not separate epidemics. They are overlapping manifestations of metabolic dysfunction. Diet operates upstream through energy density, refined carbohydrates, sodium, saturated fat, ultra-processed foods, fiber, whole grains, fruits, vegetables, and food quality patterns.

Chapter 8: MASLD and the Liver Disease Expansion

Metabolic dysfunction-associated steatotic liver disease, formerly described within the NAFLD framework, expands the food-driven disease argument beyond diabetes and heart disease. A 2025 JAMA Network Open modeling study estimated that MASLD affected 86.3 million U.S. adults in 2020, equal to 33.7% prevalence, and projected growth to 121.9 million adults and 41.4% prevalence by 2050. MASLD is strongly linked to obesity, insulin resistance, type 2 diabetes, dyslipidemia, and cardiometabolic dysfunction.

For retailers, MASLD matters because it is largely invisible to consumers at the point of purchase. A shopper buying food may be managing liver fat, insulin resistance, hypertension, cholesterol, glucose, and weight simultaneously without having a realistic way to evaluate which products are clinically preferable. Food for Health makes those hidden clinical tradeoffs visible and actionable.

Chapter 9: Heart Disease, Hypertension, and Stroke

Cardiovascular disease remains the largest mortality pillar in the chronic disease burden. The American Heart Association reports that nearly half of U.S. adults have some form of cardiovascular disease when hypertension is included. CDC reports that high blood pressure affects nearly half of U.S. adults and increases risk for heart disease and stroke. CDC also states that too much sodium can increase blood pressure and risk for heart disease and stroke, and that most sodium consumed by Americans comes from processed and restaurant foods.

These facts support a clinically practical claim: diet does not need to be the only cause of cardiovascular disease to be a dominant modifiable driver. Blood pressure, blood lipids, glucose control, and BMI are all food-sensitive, and CDC/NCHS treats these as major cardiovascular disease risk factors.

Chapter 10: Ultra-Processed Foods as the Modern Food-Environment Mechanism

Ultra-processed food evidence expands the thesis from nutrients to the real-world food environment. CDC/NCHS reports that during August 2021-August 2023, ultra-processed foods accounted for 55.0% of total calories among people age 1 and older in the United States, 53.0% among adults, and 61.9% among youth. CDC/NCHS describes ultra-processed foods as often hyperpalatable, energy dense, low in dietary fiber, and high in salt, sweeteners, and unhealthy fats.

A 2024 BMJ umbrella review evaluated 45 pooled analyses involving 9,888,373 participants and found direct associations between ultra-processed food exposure and 32 adverse health parameters spanning mortality, cancer, mental, respiratory, cardiovascular, gastrointestinal,

and metabolic outcomes. The evidence base is not perfect because much UPF evidence is observational. But it is broad, consistent, and directionally aligned with cardiometabolic disease pathways.

Chapter 11: Consumers Are Being Asked to Make Clinical Decisions at the Shelf

The second half of the Food for Health thesis is not simply that food drives disease. It is that consumers are being asked to make disease-relevant food decisions in an information environment that exceeds normal consumer capacity. Health literacy, nutrition literacy, and food literacy research increasingly defines literacy not as reading ability, but as the ability to access, understand, interpret, evaluate, and use information to make health-related decisions.

A 2026 Nutrition Reviews systematic review by Carmona and colleagues examined 49 studies and 72 relationships between health, nutrition, and food literacy and dietary behaviors in adults. Of the 72 relationships, 42 were positive, 28 were non-significant, and 2 were negative. The review found that health literacy measures generally showed the most consistent positive associations with dietary behavior, particularly when tools captured functional, interactive, and critical literacy domains.

This evidence supports a critical retail conclusion: a shopper's ability to make a healthy food choice is not only a matter of motivation. It is a matter of comprehension, translation, comparison, personal relevance, and action. Food for Health is designed to reduce that decision burden.

Chapter 12: Personalized Nutrition and the Limits of Generic Advice

Generic dietary guidance is directionally helpful but often operationally weak. NIH's Nutrition for Precision Health program states that nutrition plays an integral role in human development and disease prevention and treatment, but there is no perfect one-size-fits-all diet. NIH is investing in algorithms that predict individual responses to foods and dietary patterns, using artificial intelligence, microbiome research, metabolism, genetics, and contextual factors.

The precision nutrition literature reinforces this point. The 2015 Cell paper Personalized Nutrition by Prediction of Glycemic Responses found high interpersonal variability in post-meal glucose responses to identical meals and demonstrated that a personalized algorithm could predict glycemic responses and improve postprandial glucose outcomes. PREDICT 1 similarly demonstrated large inter-individual variability in postprandial metabolic responses to standardized meals and the potential for personalized nutrition strategies.

For Food for Health, the implications are direct. The right food for one shopper may not be the right food for another shopper. A shopper with hypertension, elevated glucose, high LDL cholesterol, celiac disease, kidney risk, or weight loss goals should not receive only a generic

front-of-pack score. The shopper should receive personalized clinical preference guidance.

Chapter 13: Retail Economics and Own-Brand Clinical Preferability

The retail opportunity is not simply reputational. It is economic. Grocers compete in a low-margin environment where loyalty, private-label penetration, basket composition, repeat engagement, and trust determine long-term value. Food for Health can help retailers move from generic private-label promotion to clinically preferable private-label switching.

The central retail question is: when two products serve the same consumer occasion, can the retailer identify the product that is clinically preferable for the shopper's personal health profile? If yes, the retailer can guide the shopper toward better health and potentially toward higher-margin own-brand products. This is not a discount strategy. It is a trust strategy.

- Increase shopper trust by making clinically relevant product comparisons transparent.
- Increase own-brand switching where the retailer product is clinically preferable.
- Improve loyalty by helping customers manage chronic conditions at the point of purchase.
- Create differentiated food-as-medicine capabilities that competitors cannot easily copy.
- Generate measurable engagement data around health goals, product discovery, and repeat purchase.

Chapter 14: Why Food for Health Is Different

Most nutrition tools are generic, nutrient-centric, or consumer-managed. Food for Health is different because it treats food selection as a clinical decision-support problem. The platform can evaluate products against personal disease states, medical goals, allergies, diet preferences, and household constraints. It can convert complex nutrition data into a clinically interpretable answer: preferable, not preferable, or conditionally acceptable for this individual.

The system does not require the consumer to become a nutrition scientist. The consumer scans, searches, or compares food. Food for Health translates evidence, product data, and personal health context into actionable guidance. That translation layer is the value.

Chapter 15: Conclusion

The evidence supports a practical conclusion for retailers: food is one of the largest modifiable drivers of chronic disease burden, and grocery retailers are uniquely positioned at the decision point where food choices occur. Consumers cannot reliably be expected to translate complex nutrition data, chronic disease constraints, and product-level variation into optimal health decisions. Food for Health provides the missing clinical nutrition intelligence layer.

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