Experimental Relationship Between Leviticus XI, Deuteronomy XIV, and Poor Health of Louisiana Population

Dr. Joe C. Guthrie, Jr.

33250 Mike Gill Road
Kentwood, LA, USA 70444

Started April 5, 2007
Completed September 25, 2007

leavesofthetree@yahoo.com

Experimental Relationship Between Leviticus XI, Deuteronomy XIV, and Poor Health of Louisiana Population

Abstract

Louisiana consistently ranks as the one of the unhealthiest states in the union. Nutritional decadence with the consumption of biblically "unclean" protein sources may present more grounds for poor health than environmental causes. A "phytotoxic" index utilizing a ratio of root growth of *Vigra radiata* in broths made from muscle tissues of selected specimens of biblically clean and unclean protein sources to that of a control solution of distilled water, along with pH and electrical conductivity were employed as test measurements. Unclean protein sources had the lowest phytotoxic indices, especially shellfish such as crayfish, crab, and shrimp. Also significant and contrary to nutritional standards was the relationship between alkaline pH measurements and unclean/unhealthy protein sources ($p < 0.0001$). It is the conclusion of this research that the over consumption of biblically unclean and alkaline protein sources, especially shellfish, represents a factor in determining the poor health of Louisiana residents.

Background

Louisiana consistently ranks as the nations unhealthiest state based on annual reports by The United Health Foundation, a private, nonprofit health information organization [1]. Louisiana outcome rankings included: cardiovascular deaths 42nd, cancer deaths 48th, infant mortality 49th, and premature death 49th. Even with improvement in some areas rated in 2005, such as a decline in the prevalence of smoking

from 29.1 percent to 24.6 percent of the population, improvement in prenatal care from 67.0 percent of women receiving care to 78.6 percent, Louisiana still continues to routinely score poorly in regard to population health statistics.

There have been a number of theories proposed to explain the poor health of Louisiana's population, including possible environmental sources. In the past, the media in particular has pointed an accusing finger at the eighty or so miles of industrial and petrochemical Mississippi riverfront from Baton Rouge to New Orleans, labeling it "Cancer Alley. Because of the high concentration of vinyl chloride plants, the primary producers of dioxins, this industrial corridor has also been rewarded with the title of Global Toxic Hotspot, and the state of Louisiana labeled by Greenpeace as a "polluter's paradise" [2].

According to Frederic T. Billings, III, in an article delivered to the American Clinical and Climatological Association in 2005, the statistics do not show "Cancer Alley" to be any greater a health concern for cancer than living anywhere else in Louisiana [3]. His study dealt with incidence of cancer, and the relationship between Louisiana industries and lifestyles. He reported that Louisiana has a population of approximately 4.5 million compared to the United States population of 281 million. Louisiana has a minority population 2.5 times greater than the rest of the country, and 40 percent of its citizens live below the poverty line. Louisiana reports approximately eighteen thousand new cases of cancer a year. Using unpublished data from the Louisiana Tumor Registry from 2004, Billings was able to produce his statistical findings. The incidence of prostate cancer is lower for the state and industrial corridor than the national average. The incidence of breast cancer for white females is lower in

both the industrial corridor and state than the national average, but black females appear to have a higher incidence in the industrial corridor, but not to the level of statistical significance. There were no statistical differences for colon or rectal cancer between state, country, or industrial corridor. For lung cancer, there was a greater incidence for the state as a whole than the country, but less of an incidence in the industrial corridor, than in the state. Although Louisiana produces one-quarter of the nations' bulk commodity chemicals, and the industrial corridor has the highest density of petrochemical industries in the nation, and perhaps the world, Billings was able to conclude that, "The incidence rates of cancer for this region are either similar to, or statistically significantly lower than the national incidence for most common cancers, including prostate, breast, colon, and rectum."

If environmental reasons can possibly be ruled out as a cause of poor health, then what other factors may contribute? Louis Sullivan, M.D. stated in November of 1990 in an address at Yale University, "the harsh truth is that a high percentage of disease and disability afflicting the American people is a consequence of unwise choices of behavior and lifestyle." Regarding behavior and lifestyle choices, we should consider nutrition when determining causes for poor health. East Jefferson General Hospital reports that more than 23 percent of Louisianans are obese, along with an additional 37 percent overweight, based on body mass index, and lead the nation in deaths attributed to obesity [4]. Following nutritional guidelines, diet choices and pyramids exclusively may not provide the needed answers for increasing the health of Louisiana's population. The cause of poor health in Louisiana may be found in scripture from the Holy Bible, specifically the dietary principles found in Leviticus XI and Deuteronomy XIV.

The food laws of the Old Testament are our oldest nutritional standards and were part of a guide to good health based on prevention that also included sanitation, infection control, and personal hygiene. The importance of food laws first began in the Garden of Eden when man was restricted from eating of the Tree of Knowledge of Good and Evil. According to the Holy Bible, man initially was a vegetarian with food sources restricted to fruits, grains, nuts, and legumes (Genesis 1:29). Not until after the Flood, was Noah and his descendants permitted to eat meat (Genesis 9:2-4). Leviticus XI and Deuteronomy XIV deal with the Mosaic Law regarding food laws for clean and unclean, and edible and not edible animals. In the book of Daniel, we are given the first food pyramid to be used as a rule for sources of healthy nutrition. In order to prove the health benefits of abstaining from the "unclean" food of the king, Daniel requests a ten-day trial, where he and his friends will eat nothing but vegetables, and drink only clean water (Daniel 1:12). After the ten day test, Daniel and his friends were found to be," …better in appearance and fatter in flesh…and in every manner of wisdom and understanding, he found them ten times better than all the magicians and enchanters that were in the kingdom." We may conclude from this the healthy ratio of 10:1, fruits and vegetables versus animal protein.

The protein derived from fish, bird, and animal sources provides the basic structural material of the body, and provide the most varied functions of any molecule in the body. But while necessary for proper nutrition, proteins might best be considered a supplement to our diet rather than a staple. Leviticus, Chapter 11, restricts animal sources to only those animals with a split hoof and chew the cud as a food source: Cattle, sheep, deer, and goats. Such animals as swine, squirrel, rabbit, camel, and reptiles are

excluded as food choices. Birds excluded were Raptors and scavengers. Fish were required to have both fins and scales, in order to be considered as a clean food source. This excluded such seafood sources as catfish, and shellfish.

In 1953, David Macht, M.D. of John Hopkins University, an experimental biologist whose methods of assessing pharmacological toxicity are still used today, published research findings from a study he conducted at John Hopkins entitled, "An Experimental Pharmacological Appreciation of Leviticus XI and Deuteronomy XIV [5]." He tested the effect on the root growth of seedlings of *Lupinus albus* grown in plant-physiological solutions containing the necessary salts and ions for their growth, with and without the addition of muscle juice of clean and unclean animals. A "phytotoxic index", based on a ratio of the comparison of the range of root growth of muscle juice solution of clean and unclean animals to that of a control saline solution, was used to determine toxicity of protein sources. It was found that solutions prepared from "clean" animals, fish, and birds as described in Leviticus XI and Deuteronomy XIV were practically non-toxic, while solutions from "unclean" muscle extracts were considered toxic. A total of 21 animals, 14 birds, and 51fish specimens were used. Notably absent from the list of fish were any examples of shellfish. His experiment corroborated the biblical position that those animals, birds, and fish listed as "unclean," were not healthy for human consumption.

Louisiana is well known for its Cajun and Creole cuisine. Tourists from all over the world come to Louisiana to share and taste the state's unique culture and ethnicity, including the seafood dishes in its many restaurants. Louisiana seafood recipes rely heavily on the use of shrimp, crab, crayfish, and catfish as staples in preparing traditional

dishes. What the Bible would consider unclean/inedible food, are the primary sources of seafood for Louisiana. In a study entitled, "Survey of Fish and Shellfish Consumption by Residents of the Greater New Orleans Area," conducted by Ann C. Anderson and Janet C. Rice with Tulane University, School of Public Health and Tropical Medicine, they suggest that consumption of contaminated fish/shellfish may create a substantial risk to human health, especially in Louisiana which is second only to Alaska in total fisheries' products [6]. From their survey, they determined that 60.5% of the respondents had eaten seafood once in the last week, and 25% had eaten seafood twice during the same time frame. The type of seafood eaten was first shrimp, 32.3%, followed by catfish 25.8%, speckled trout 15.7%, and crab 12.5%. Six percent of the respondents to the survey had eaten crayfish the week of the survey. This was considered low secondary to the survey being done at the end of the crayfish season. Estimated daily consumption of seafood for New Orleans area residents was based on one and two seafood meals a week.

Table 1. *Estimated daily consumption (in grams) of fish/shellfish by residents of the greater New Orleans area.*

Food	One meal a week	Two meals a week
Shrimp	16.3-32.6 grams	32.6-65.1 grams
Catfish	22.7 grams	49.5 grams
Speckled Trout	30.8 grams	61.5 grams
Other Salt Water Fish	29.0 grams	58.0 grams
Tuna (fresh)	16.3-32.6 grams	32.6-65.1 grams
Other Fresh Water Fish	10.4 grams	20.9 grams
Crawfish	13.0-19.5 grams	26.0-39.0 grams
Crab	26.0 grams	52.0 grams

There were no differences found in consumption of seafood based on race or income. They also reported that 62% of fresh water finfish and 50% of saltwater finfish were either self-caught or gifts from anglers.

It is the premise of this author that a contributing factor to the poor state of health of the population of Louisiana is a greater than average consumption of "unclean" protein sources as described in Leviticus XI and Deuteronomy XIV. A research tool similar to that of Dr. Macht was utilized, whereby the measured root growth was used to determine toxicity of broths made from meat and seafood commonly used as food sources. Samples of both "clean and unclean" specimens were utilized. Furthermore, this study attempts to characterize the chemical relationships and factors, including pH and electrical conductivity, which may suggest a working model to explain the health benefits of such foods.

Method

In order to test toxicity of selected protein sources commonly seen in Louisiana diets, a "phytoxic index" was used, utilizing a ratio of root growth in a broth made from the muscle tissues of selected species to that of a control solution of distilled water. A control solution of distilled water with an electrical conductivity measurement of 0.0 µSiemens was used in order to make electrical conductivity comparisons with the test broths. Water was distilled with a Pure Water model Mini Classic water distillation unit. Mung beans, *Vigra radiata*, were used to determine root growth. Four pounds of non-GMO, certified organic, *Vigra radiata* beans were purchased from Sprout People Organic Seeds, Madison, Wisconsin, and used for testing sprout root growth. Protein sources tested included lamb, beef, deer, pork, chicken, redfish, speckled trout, catfish, blue crab

(fresh), blue crab (processed) white shrimp, red swamp crayfish (fresh) and red swamp crayfish (processed). All purchased meats and seafood were from local supermarkets and seafood markets. Broth for testing was prepared by mixing 90ml by volume of diced muscle tissue from each specimen with 400ml of distilled water, and brought to a boil. After being cooled, all broth specimens were tested for pH with a Horiba compact pH meter, model B-213, and for electrical conductivity with a Hanna HI98312 EC/TDS meter. Broth specimens were then refrigerated. Forty *Vigra radiata* beans were placed in each of fourteen, clean, clear, plastic 250ml cylinders with perforated lids. The test cycle consisted of first soaking the *Vigra radiata* beans overnight in 30ml of the thirteen test broth solutions, and the control solution of distilled water. The next nine days, each of the bean samples was rinsed daily with its test broth or control solution, and time of rinsing recorded. During the testing cycle, the cylinders were maintained in a warm dark room. After a total of ten days, the test cylinders and their contests were photographed. Contents of the cylinders were then removed and measurement of root growth of bean sprouts made by hand in millimeters and recorded.

Results

Table 2. *Growth results, chemical measures, and phytotoxic indices.*

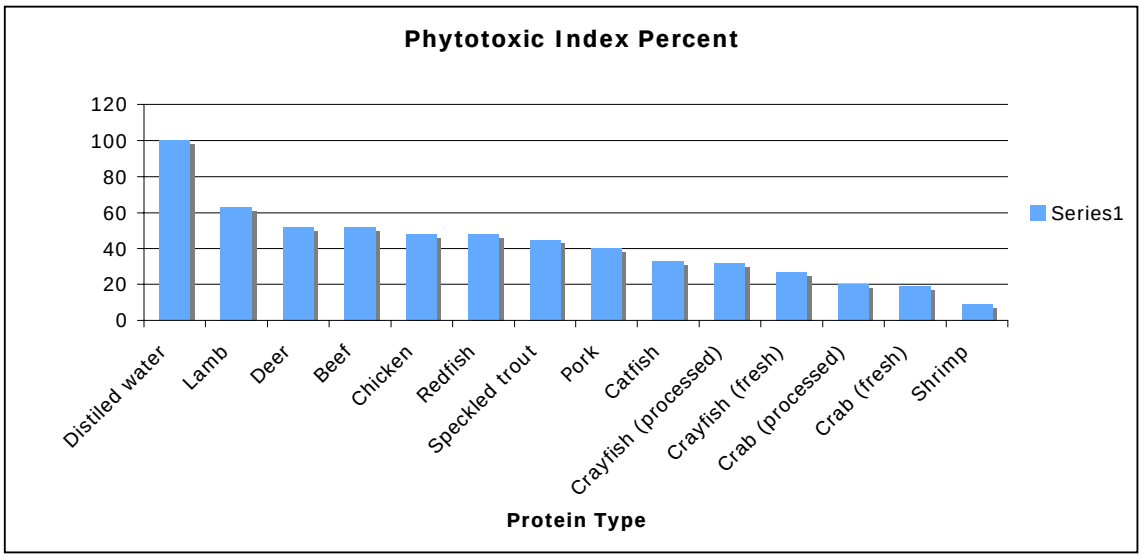
Solution source	Mean Growth	Phytotoxic Index	pH	Conductivity
Distilled water	93.500mm	100%	6.3	0.0µS
Control solution				
Lamb	59.125mm	63%	6.3	2.9µS
Ovis aries				
Deer	48.525mm	52%	6.0	2.5µS
Odocoileus virginianus				
Beef	48.325mm	52%	5.9	2.8µS
Bos taurus				
Chicken	44.675mm	48%	6.5	2.8µS
Gallus gallus				
Redfish	44.525mm	48%	6.9	1.8µS
Sciaenops ocellatus				
Speckled Trout	41.825mm	45%	7.3	1.3µS
Cynoscion nebulosus				
Pork	37.525mm	40%	5.9	3.0µS
Sus scropa				
Catfish	37.525mm	33%	6.9	2.0µS
Ictalurus punctatus				
Crayfish-processed	29.775mm	32%	7.9	2.6µS
Procambarus clarkii				
Crayfish-fresh	25.825mm	27%	8.6	2.8µS
Procambarus clarkii				
Crab-processed	18.800mm	20%	8.7	3.7µS
Callinectes sapidus				
Crab-fresh	18.150mm	19%	8.2	5.8µS
Callinectes sapidus				
White Shrimp	8.425mm	9%	8.4	2.3µS
Penaeus setiferus				

Photo 1 seafood specimens

Photo 2 measurement

A "phytotoxic index" was calculated as the ratio of average root growth of each test broth solution to the average root growth of the control *Vigra radiata* sprouts grown in distilled water (Table 2). Comparison was also made with all test specimens regarding pH and electrical conductivity measured in micro-Siemens (µS) and listed in Table 2.

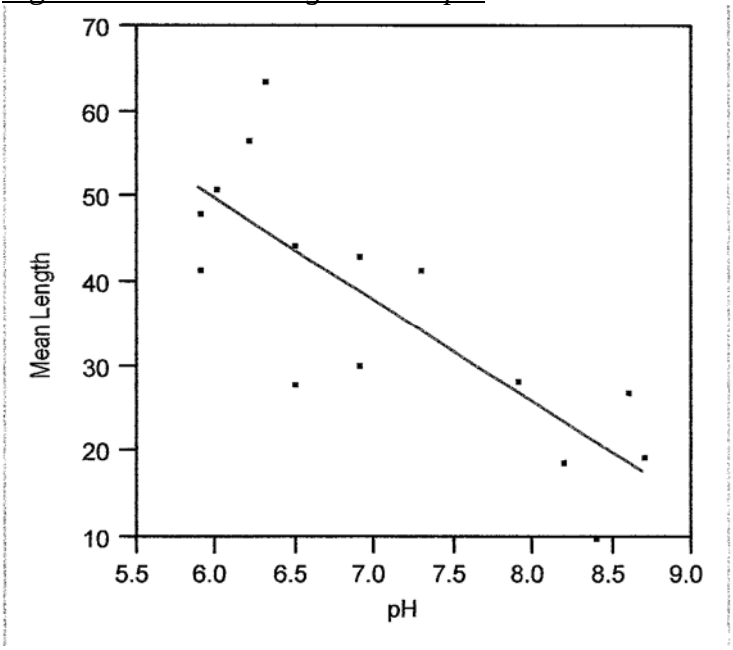
Figure 1. *Graphic representation of phytotoxic index ratio as percentages*.



As shown above in Figure 1, “unclean” protein sources had the lowest of all phytoxic indices. This is especially true in the case of shellfish such as shrimp, crab and crayfish versus “clean” lamb, deer, and beef meats. There was no significant difference between the phytotoxic ratios for processed versus fresh seafood.

Regarding pH and conductivity, regression analysis was performed on the mean root length for each species and/or type versus pH or conductivity. As demonstrated in figure 1, there was a significant negative relationship between mean root length and pH ($p < 0.0001$, F-ratio = 24.49). This relationship is represented by the following regression equation: 121.643 – 11.95(pH). This model indicates that for every one pH unit increase in alkalinity, there is a corresponding 11.95mm decrease in mean root length. The relationship between mean root length and conductivity was found to be non-significant in this study.

Figure 2. *Mean root length versus pH*.



Discussion

Much like Macht, we can take smaller phytotoxic ratios, and their corresponding percentages, to indicate greater toxicity to the growth specimen. The results seem to indicate that those protein sources identified in the Mosaic dietary laws found in Leviticus XI and Deuteronomy XIV as "clean" were significantly more nourishing to the *Vigra radiata* growth specimens, whereas the "unclean" proteins were remarkably more toxic, especially shellfish without regard for processed or fresh forms.

Despite previous claims that alkalinity of foodstuffs is associated with greater health benefits the results of this study appear to demonstrate the converse. Here we find that more alkaline protein sources are associated with diminished *Vigra radiata* sprout growth in a significantly negative relationship. The implication is that the more of these high-pH proteins sources consumed in the Louisiana diet—shellfish, catfish, etc.—the greater the negative impact on fundamental metabolic processes and health. Could this be the reason that Louisiana is consistently found to be one of the unhealthiest states in the union? It is reasonable to conclude that such a diet may very well contribute to the poor health of Louisiana citizens.

In his book, *Maximum Energy*, Dr. Ted Broer lists shellfish as number two in his list of the "Ten foods You Should Never Eat,"[7]. He lists three reasons for their elimination from healthy food sources as, first God's word warns against their consumption. Second, his list is based on research findings such as those in Dr. Sandra Steingraber's book, *Living Downstream,* where she points out that shellfish such as lobsters do not get cancer as they are able to sequester carcinogens in their tissues in such a manner as to prevent damage to their chromosomes [8]. Dr. Broer refers to lobsters as aquatic "Typhoid Marys." Third, he makes reference to shellfish being contaminated by environmental factors at an alarming rate, and that they are passing these contaminates to everything and everyone that eats them. Dr. Broer has likened crabs, crayfish, shrimp, and other scavenger crustaceans to aquatic cockroaches.

A possible explanation for the relationship between increased alkalinity of protein sources and poor health may be as a result of diminished protein digestion. The increased alkalinity of unclean protein sources may interfere with the gastric phase of digestion resulting in decreased release of gastric juice and HCL, or the neutralization of HCL

resulting in poor digestion of proteins. Poor digestion of proteins during the gastric phase would result in the transfer of the putrid and toxic protein bolus along with any toxins or parasites not normally neutralized by a healthy low pH gastric environment. The entry of the more alkaline proteins would fail to signal for the proper release of secretin and resulting pancreatic juices necessary for proper digestion. Limited consumption of clean, slightly acidic protein sources such as beef and lamb may not interfere with gastric digestion. Further research regarding this theory would be warranted.

There has always existed an underlying culture of decadence in Louisiana. Examples of that decadence can be found in the early history of the state with an economy allowing for the piracy of the Lafittes, the Creole inhabitants religious association with Voodoo, and the corruption of flamboyant politicians. Louisiana even celebrates immorality in general annually in New Orleans with the Southern Decadence Festival. It is nutritional decadence that has resulted in Louisiana's cultural and ethnic diet that on occasion is sampled by visitors and tourists, but routinely relied on by many of its citizens for daily nutrition, resulting in general poor health. Hippocrates, the father of medicine, is said to have advised, "Let your food be your medicine, and your medicine be your food."

Conclusions

It is the conclusion of this study that a nutritiously decadent diet consisting of biblically "unclean," high pH protein sources, especially shellfish such as shrimp, crab, and crayfish, is detrimental to the health of Louisiana citizens. Core protein needs should be met through limited consumption of biblically "clean," low pH varieties. Continued research regarding the health benefits of protein sources based on pH is recommended.

When examining Leviticus XI and Deuteronomy XIV with regard to healthy nutrition, we would do well to remember Exodus 15:26, "If you will give heed to the voice of the Lord your God, and do what is right in His sight, and give ear to His commandments, and keep all His statutes, I will put none of the diseases on you which I have put on the Egyptians, for I, the Lord, am your healer."

Acknowledgements

The author wishes to acknowledge the research of Dr. David Macht regarding the nutritional value of the Bible's dietary statutes. I am indebted to Dr. John Jester and Prof. Charles McWilliams for their wisdom and mentoring in the study of natural medicine. I would also like to thank my son, Dr. Joseph Casey Guthrie for his invaluable assistance in computer technology and editorial assistance. Most importantly, it is in the name of my Lord and Savior, Jesus Christ, that I give thanks to my God, the source of all true wisdom and knowledge.

References

1. United Health Foundation. (n.d.) *America's Health Rankings.* [accessed April 2007]. http://www.unitedhealthfoundation.org/ahr2006/states/StateSummery.html
2. Holland, J.M., (2001) Touring Cancer Alley. [assessed April 2007]. http://www.hartford-htp.com/archives/45/295.html
3. Billings, F.T., (2005) Cancer Corridors and Toxic Terrors-is it Safe to Eat and Drink? *Transactions of the American Clinical and Climatological Association,* 116, 115-125.
4. East Jefferson General Hospital Examiner. (2006, October 11). *Beating the Odds: Staying Healthy in the Unhealthiest State.* [assessed April 2006]. http:// www.eastjeffhospitol.com/membership/healthylifestyles/articles/beatingodds.html
5. Macht, D.I., (1953) An Experimental Pharmacological Appreciation of Leviticus XI & Deuteronomy XIV. *Bulletin of the History of Medicine.* 27(5), 444-450.
6. Anderson, A.C., & Rice, J.C., (1993) Survey of Fish and Shellfish Consumption by Residents of the Greater New Orleans Area. *Bulletin of Environmental Contamination and Toxicology.* 51, 508-514.
7. Broer,T. (2006). Sidestep the Hidden Hazards of Shellfish. *Maximum Energy* (pp. 181-195). Lake Mary, FL: Siloam, A Strang Company.
8. Steingraber, S. (1997). *Living Downstream: A Scientist's Personal Investigation of Cancer and the Environment.* New York: a Division of Random House, Inc., 140-142.

Tables and Figures