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Wellness Institute

Pottenger's Prophecy

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Introduction

The catchy title of this newsletter is borrowed from a book released in 2011. The thesis of the book is that the work of Pottenger predicted the modern science of epigenetics, the idea that dietary intake can alter the manner in which the genes express themselves without any change in the underlying genetic material.

Francis M. Pottenger, Jr. was the son of a physician who co-founded the Pottenger Sanatorium for treatment of tuberculosis in Monrovia, California. The younger Pottenger bought some of the cottages on the property and established a hospital to treat non-tubercular respiratory diseases such as asthma and allergies.

Pottenger is most famous for his cat studies which have had a continuing influence upon nutritional studies since they were conducted. Before discussing the study it is important to explain the factors which led Pottenger to conduct the study.

Reference:

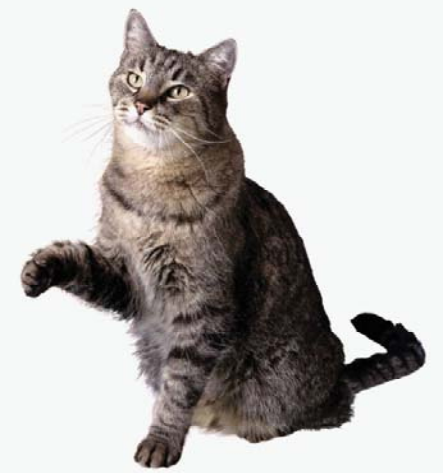
Graham, Gray, Kesten, Deborah, and Scherwitz, Larry, *Pottenger's Prophecy How Food Resets Genes for Wellness or Illness*, Amherst, Mass: White River Press, 2011.

The Prelude

Pottenger lived at a time when science was making great strides in understanding nutrition and endocrinology. He combined the two disciplines in treating his patients. Pottenger was heavily influenced by his contemporary Weston Price who travelled around the world to discover what kind of a diet would promote healthy teeth. Price came to the conclusion that fatty foods rich in vitamins A and D were essential for optimal health. Pottenger incorporated glandular meats like liver as well as cod liver oil, butter, cream and eggs into the diets of his debilitated patients.

Pottenger further supplemented the diet of his patients with crude extracts from the adrenal cortex of cattle. The adrenal cortex is the outer part of the gland which possesses anti-inflammatory properties.

Adrenal cortical extracts varied greatly in potency. In order to standardize his doses Pottenger removed the adrenal glands from cats and gave them his adrenal extracts in order to gage the potency of the product.



References:

Pottenger, Francis M., Jr., *Pottenger's Cats*, edited by Elaine Pottenger and Robert T. Pottenger, Jr., La Mesa, CA: Price-Pottenger Nutrition Foundation, 1983, 1-14. All references are from this source unless otherwise indicated. Purchase of the book will provide much more detailed information.

The First Discovery

This process led Pottenger to his first discovery. He learned that the glands with the highest potency came from animals fed fresh grass in Denver while the least potent adrenal glands came from animals fed industrial by-products such as molasses, cotton seed meal, beet, orange and grape pulp, and dried alfalfa and grain in Los Angeles.

Understanding this discovery is important because Pottenger found that cats fed raw milk from cows that were fed dry feed developed the same type of deficiencies as cats fed pasteurized milk. In other words, the value of a potentially high quality animal food can be diminished or eradicated by feeding the animal inferior food. This has tremendous implications for the manner in which farm animals are fed today.

Pottenger observed the same principle of dry feed versus fresh feed in the chicken industry. Chickens given a fresh diet "lay eggs with hard shells and deep yellow yokes." These animals has supple skin, firm musculature and almost twice as much calcium in their bones as hatchery chickens.

By contrast, hatchery chickens "lay eggs with thin shells and pale yokes." The hatchery chickens had "thick skin, lax musculature, pale fat, soft flesh and much smaller bones than the farm chicken."

In another follow-up experiment guinea pigs were fed a diet of rolled and cracked grain with supplements of cod liver oil and field-dried alfalfa. The animals rapidly showed hair loss, paralysis, diarrhea, pneumonia and high litter mortality.

Animals fed fresh cut grass showed remarkable improvement. The animals did not make a total recovery, however, until they were let loose from their cages and allowed to run outside their pens and feed on the available weeds and grass. Pottenger felt that some of the heat labile or heat sensitive nutrients were being destroyed as the fresh cut grass began to compost almost immediately manifesting a temperature increase of as much as 30 degrees.

Pottenger, 18-20.

The Cat Study

Pottenger was overwhelmed with donated cats when the local population learned that he needed them to standardize his adrenal cortical extracts. He had far more cats donated than he could possibly feed with the leftover meat scraps (including internal organs such as liver, heart and brains) from the sanitorium. He began to feed these animals raw meat purchased locally. He soon noticed that the raw meat fed animals handled the removal of the adrenal glands far better than did the animals being fed the cooked meat scraps. This observation suggested the cat study.

Pottenger's famous cat study was designed to study the effects of lack of sufficient supply of what he called "heat labile" factors in the diet. Pottenger induced a deficiency in these heat sensitive nutrients simply by cooking 2/3 of the dietary intake. The study was conducted from 1932 until 1942. The Pottenger Cat Study is unique and one will not find another like it in the medical literature.

Pottenger conducted a variety of experiments. These experiments consisted of feeding animals cod liver oil and 1/3 of the diet raw meat or milk. The remaining 2/3 of the diet consisted of the experimental diet which might consist of raw meat, raw milk, cooked meat, pasteurized milk, or sweetened, condensed milk.

Animals on a completely raw diet maintained a consistent level of good health through a period of four generations. Progressive degenerative changes were evident in the animals being fed all forms of cooked foods.

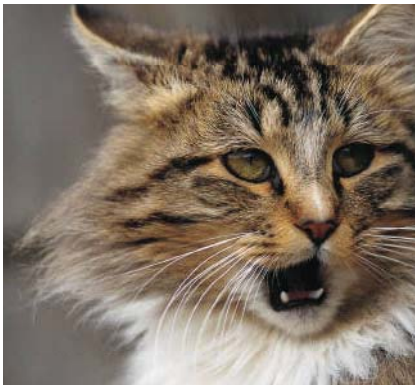
Behavior

Pottenger observed remarkable behavioral changes in animals fed heated milk and cooked meat. The animals were much more irritable. Some of the females became dangerous to handle and three of them were named Rattlesnake, Cobra and Tiger. The tried to bite and scratch the handlers. By contrast, male animals became more docile and unaggressive with little interest in sex. In other words, there was a reversal of normal behavioral roles.

Animals fed raw foods were "gregarious, friendly and predictable in their behavior patterns."

Pottenger discovered that pronounced exhaustion was a universal symptom of nutrient deficiency.

Pottenger, 10-11, 46.



Degeneration

Pottenger made the following observation, "Cats can be so reduced in vitality by just one year of a diet considered adequate for human consumption that it may take them from two to three years to recover from injury, if they can recover at all." Poor diet during early development would compound a poor family dietary history, which improved nutrient intake would ameliorate the degenerative process. Third generation deficient animals did not survive past the sixth month of life.

A wide variety of degenerative changes similar to what we see in the human population were evident. This included heart problems, nearsightedness and farsightedness, underactive thyroid glands, and a wide variety of tissue infections including of the kidney, liver, testes, ovaries and bladder.

Pottenger once commented upon this degenerative process. He wrote, "While no attempt will be made to correlate the changes in animals studied with malformations in humans, the similarity is so obvious that parallel pictures will suggest themselves."

Pottenger, 41-42, 10, 3.

Regeneration

Pottenger placed first and second generation animals on raw food diets in an attempt to regenerate them. He found that they could be regenerated but it took four generations of a raw food diet. Reproductive inefficiency hindered the regenerative process. Resistance to disease was noted in the second generation of regenerating animals and allergies persisted into the third generation.

Pottenger, 12-13.

Parasites

The list of physical defects was overwhelming. Malnourished animals became infested with internal and external parasites. Skin lesions were common.

Pottenger, 11.

Allergies

Allergies appeared and became progressively worse from generation to generation. Second and third generation animals developed abnormal lung tissues and suffered with respiratory problems including bronchitis and inflammation of the lung tissue. One animal developed asthma, the first such case to be reported in the research literature.

Cats given cooked meat and milk develop all kinds of allergies. "They sneeze, wheeze and scratch. They are irritable, nervous and do not purr." Almost all animals have allergies by the third generation.

Milk allergy was common. This was demonstrated by removal of the milk from the diet which caused the allergy symptoms to abate.

Pottenger observed a dramatic alternation of the physiology of the digestive tract of allergy prone animals. The average cat has an intestinal tract 48 inches long. The intestinal tract of allergy prone cats was often 72-80 inches long and lacking in tone and elasticity.

Pottenger, 11, 33-35.

Reproductive Failure

Reproductive failure was common in cooked meat fed animals. The reproductive failures included failure of sperm production in males and spontaneous abortion in females. First generation animals aborted in about 25 percent of pregnancies while abortions in the second generation of animals given cooked foods was about 70%.

There were no successful pregnancies in animals fed cooked foods for three generations. Offspring of cooked meat animals weighed quite a bit less than raw meat animals.

Female cooked meat animals suffered ovarian atrophy and uterine congestion. Some of the female cats steadily declined in health after delivery of a litter and would die of obscure causes after about three months.

Onset of reproductive inefficiency was rapid. A female cat subjected to a deficient diet for 12 to 18 months was never again able to give birth to normally healthy kittens even after being placed on an optimum diet for three or four years. Pottenger noted that animals malnourished during 6 months which corresponded to the human teenage years delivered offspring with deficiency symptoms even though the parent female appeared in good health.

Pottenger, 11, 13.

Changes in Bones

Bone changes were dramatic. Long bones tended to increase in length and decrease in diameter. Calcium content of the thigh bone in first generation animals was 12-17%. In second generation animals it dropped to 8-12% and in third generation animals it was an astonishing 1 1/2 to 3%. Bones of animals in the third generation were as soft as rubber.

Infections of the bone were common and often resulted in death. Arthritis and inflammation of the joints were also common.

Changes in the bones of the face became obvioius as the face narrowed and flattened. A retraction of the middle third of the face developed due to interrupted development of the sinuses and cheek bone (zygomatic arch).

Pottenger, 41, 30, 10.

Changes in the Mouth

Degenerative changes in the mouth of cooked food animals began within as little as 3 months on a poor diet. Pregnant animals showed the changes most rapidly lending credence to the proverb about the loss of "a tooth for every child."

The most obvious dental changes were inflammation of the gum tissue (gingivitis) and tartar buildup (incrustation of salivary calculi). As the mineral deposits built up on the teeth it resulted in spongy gums prone to infections and abscesses. This was followed by loss of teeth. There was no tooth decay in first generation animals.

Teeth of second generation cats were characterized by crowding, twisting and impaction. Erruption of new teeth was more difficult and associated with bleeding gums, runny noses and fevers. The decrease in skull size creates considerable dental problems for second and third generation animals on cooked foods.

Meat and Milk

The changes which have been discussed were primarily derived from Pottenger's observations with cooked meat animals. The degree of the processing of the milk determined the rapidity of onset of the problems and relative severity. Thus evaporated milk caused more damage than pasteurized milk.

Sweetened condensed milk caused the most marked deficiencies. These cats developed "much heavier fat deposits." Skeletal deformities were more severe. These cats were unique in manifesting extreme irritability and pacing "back and forth in their cages nervously."

Pottenger, 15-16.

Key Observations from Pottenger's Cats

A nutritionally impoverished mother can not produce healthy milk for her child. (49)

We assume that the sterilization of milk is essential because of the work of Pasteur. Unfortunately destruction of heat sensitive nutrients in milk by pasteurization may do more harm to

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more individuals than the benefit provided by sterilizing the milk. (57)

Calcium utilization is diminished when foods are heated. (62)

Our health is influenced by the diet of our ancestors. To be healthy we need not only a good genetic inheritance, but also a healthy diet. (79)

The most critical time for good diet is during pregnancy followed by the importance of good nutrition during infancy and adolescence. (79) (94)

Artificial fertilizers are not only damaging to soil bacteria and earthworms, but they also work to the long-range detriment of the health of human beings. (83)

The primary concern of the food industry in prevention of rancidity and shelf life. Unfortunately, processing and stabilizing of vegetable oils and cereal grains has rendered the finest sources of unsaturated fats in the diet useless for anything but heat production in the body. Pottenger's regenerative diet involved a high intake of protein and quality fat and a low intake of carbohydrates. (99)

An Anecdote

A reporter came up to Pottenger at a nutrition meeting and asked, "Are all these people here interested in nutrition?" Francis answered, "Yes."

The reporter commented, "They certainly are not a very healthy looking crowd."

To which Francis replied quizzically, "Why do you think we are here?" (118)

Final Word

"What vital elements were destroyed...?...Ordinary cooking precipitates proteins, rendering them less easily digested. Probably certain albuminoids and globulins are physiologically destroyed. All tissue enzymes are heat labile and would be materially reduced or destroyed. Vitamin C and some members of the B complex are injured by the process of cooking...Minerals are rendered less soluble by altering their physiochemical state. It is possible that the alteration of the physiochemical state of the foods may be all that is necessary to render them imperfect foods for the maintenance of health." Pottenger demonstrated experimentally that poor diet altered the manner in which genes express themselves.

REFERENCE:

Pottenger, Francis M., Jr., The effect of heat-processed foods and metabolized vitamin D milk on the dentofactial structures of experimental animals, *American Journal of Orthodontics and Oral Surgery*, Aug. 1946, 467-485.

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