NTD 212 ASSIGNMENT

18/MHS04/002

SCHOLASTICA IGHAGBON

Write about 10 important scientist who have made significant contributions to the field of human nutrition and highlight their discovery.

1. **W.K. Kellogg**

Kellogg was an industrialist in food manufacturing, he founded the Kellogg company with his brother in 1906, and focused on producing and endorsing corn flakes as a wholesome breakfast. Since then, the company has taken off and makes countless varieties of cereal, snack bars, beverages, Eggo waffles, and crackers. Kellogg’s was one of the first food companies to put a nutrition label on their packages, as well as the first to put a toy for kids in cereal boxes. During the Great Depression, he arranged the shifts in his factory to allow as many people to work as possible, and later established the W.K. Kellogg Foundation, which helps children in need succeed in school, work and life. He donated 66 million dollars to the foundation over the course of his life, which is equivalent to 1.2 billion dollars in today’s currency.

2. **Louis Pasteur**

Louis Pasteur was a French microbiologist and chemist in the 1800s who made many huge advances in the world of medicine as well as food. After created the first vaccines for anthrax and rabies, he went on to develop a process for killing bacteria in food that we have been using ever since: pasteurization. Before this, there was no real method of killing bacteria in beverages, and the bacteria that was already there would rapidly grow, because it was living in a wet, sugary environment (which bacteria love). Pasteur found a way to heat beer and wine just enough to kill enough bacteria to keep it from spoiling (as quickly, anyway). We have refined his method since then, but still use his basic principle to keep beverages like milk and juice from going bad and making people sick.

3. **Alton Brown**

Alton Brown is a food scientist. A TV personality, cookbook author, and celebrity chef, he spread tons of information about the science behind food on his show Good Eats. Brown was disappointed in the amount of information in American cooking shows and wanted to make his own. He went to culinary school and studied a lot of science to prepare for making his own show, and then used Good Eats as a platform to education millions of viewers on the science behind the food they make at home.

4**. Agnes Fay Morgan**: Her early work focused on the vitamin content of processed foods. She was the first to demonstrate that a commonly used food preservative, sulfur dioxide, had a protective effect on vitamin C and a damaging effect on thiamin. She also studied the vitamin content of many important California-grown foods, i.e., wheat, almonds and walnuts, and the effects of processing on them. She was interested in defining the cause of low weight in children, and she showed that small supplementary feedings with fruits, milk and wheat germ improved the growth of school children. Using various animal models, rats, guinea pigs, hamsters and cocker spaniels, she analyzed the relationships between vitamins and hormones. Her studies of dietary calcium, phosphorus, vitamin D and parathyroid hormone demonstrated that an over dosage of vitamin D produced brittle bones and calcification of soft tissues. She also investigated interactions between vitamin A, carotene and thyroid secretion, and between riboflavin, panthothenic acid and adrenal gland secretions.

Her research of pantothenic acid and adrenal gland function brought her the most recognition. In 1940 she showed that pantothenic acid is essential for normal pigmentation of hair and skin. A diet deficient in the B vitamins was systematically supplemented with thiamin, chloride, riboflavin, a wheat germ preparation, yeast extracts and adrenal cortex extracts to show that the depigmentation of the hair of the animals was due to adrenal insufficiency caused by a lack of pantothenic acid.

5. **Doris Howes Calloway (1923–2001)**

Doris Howes Calloway, also a member of the faculty at the University of California at Berkeley, was born on Valentine's Day in 1923 in Canton, Ohio. Her father and mother both worked as private investigators. After her father's death when she was 3 years old, her mother supported Doris and her sister, June. Doris attended public schools in East Canton, Ohio, where she excelled graduating from high school as valedictorian of her class when she was only 16. While in high school, she worked in a bookstore, but she was dismissed because she spent more time reading the books than assisting customers. She also had an interest in music and took ballet and tap dancing lessons. Dr. Calloway conducted research on a broad spectrum of human nutrition and food science, most of which was completed using the metabolic facilities in the “Penthouse” at Berkeley. Her work focused on gut microflora and intestinal gas, metabolism of nitrogen and amino acids in humans, human energy requirements and the functional consequences of marginal nutrition. Like other women nutrition scientists, much of her research focused on issues about women, i.e., the menstrual cycle, pregnancy and lactation, and energy needs for women's work. Dr. Calloway was concerned about the lack of information regarding nutritional allowances for women. Thus, she studied menstruation and the protein and energy requirements of women. Her studies of the hormonal changes during the menstrual cycle showed that nitrogen retention tended to increase at the time of ovulation and just before or at the onset of menstruation. She also observed an energy cycle in menstruating women with the lowest basal metabolic rate occurring about one week before menstruation. Based on these cyclic variations and other information, Dr. Calloway estimated that the energy and protein allowances for men and women should be similar, unless the women are pregnant, in which case they should receive more.

**6. Wilbur Olin Atwater**

Wilbur Olin Atwater, an American chemist, was born May 3, 1844 in Johnsburg, New York. Atwater is known for his studies in human nutrition and metabolism. He pursued an undergraduate degree at Wesleyan University in Connecticut and later went on to obtain his PhD from Yale University’s Sheffield Scientific School in agricultural chemistry (5). Atwater invented a device called the respiration calorimeter that measured human metabolism balance by analyzing the heat produced and metabolic rate by a person performing certain activities. This new invention aided many new studies in dietary evolution and food analysis.

Energy and protein sources were studied and measured to determine that certain foods provide different amounts of nutrients and energy than other. The fat, protein, and carbohydrates of all different kinds of foods were observed and soon there was an awareness of the food calorie. Atwater continued to lead research teams on discovering nutrient requirements, food composition and consumption, and consumer economics (6). Throughout his discoveries, Atwater determined that Americans eat more unhealthful foods than desired and do not exercise enough.

**7. Florence Nightingale**

Florence Nightingale, born 1820 in Tuscany into an upper class family, need be mentioned as a contributor to Dietetics as she was the one who acknowledged the need for safe and nutritious food for soldiers during the Crimean War (7). She was actually a pioneer nurse in her time and was determined to improve the living conditions at the camp hospitals and made and effort to clean and organize facilities where patients were cared for. Her contributions helped spread awareness of the necessity for clean, safe, and nutritious foods.

There is a long history of health and nutrition and the involvement and contribution of many people and their discoveries has made great progress. Most of the progress has been made in the last 100 years, as new technologies have been a great asset to nutritional health and implementation. Scientific advances, social and economic factors, and military conflicts are contributors to the advancement of the dietetic profession as well. The most important contribution would have to be the determination and dedication by early dietitians who knew that there was a difference to be made and that they were the ones who would be able to make that difference’

The understanding and importance of good eating habits was not common not known to most of society, or perhaps just not understood. Scientific experiments were documented and scholarly journals written, but they were for almost impossible to understand by anyone who was not in the dietetic profession. Alice Blood was the one who would be able to put all of the difficult works into something that could be understood by large public audience. She translated science-based nutrition information into easy-to-read pamphlets in an effort to educate people on good nutrition.

**8. François Magendie**

 Grew up in revolutionary Paris and practiced as a surgeon before changing to physiology. His first work in the field was reported to the Academy of Sciences in 1816, and addressed directly the question as to whether animals could use atmospheric nitrogen to “animalize” ingested foods of low nitrogen content. There was, of course, a plentiful supply of nitrogen in the air, and some chemists had suggested that this kind of combination must occur during an animal's digestion of plant foods so as to give the ingesta the characteristics that would allow them to be incorporated into the animal's own tissues either for growth or replacement of worn-out materials.

Magendie's famous experiment was a very simple one, so simple that one wonders at its never having been tried before. It was to take a single food that was accepted as being nutritious, even though it did not contain nitrogen, and to feed it to dogs, a species that would eat both plant and animal foods. Sugar was the food that he tested with his first dog. It continued to eat well for about 2 wk, but then began to lose weight and to develop a corneal ulcer. After a month it died. He repeated the experiment, and then tried using olive oil, gum or butter as the sole foods for his dogs, in each case with the same result, except that no ulceration was seen in the dog receiving olive oil.

His conclusions were that none of these foods was “preeminently nutritive” (which I take to mean “providing all the dogs' needs”), even though they were well absorbed, and, second, that at least the majority of the nitrogen in a dog's tissue must come from the food that it has consumed. With hindsight, we can see the gap in his reasoning; there may have been other deficiencies in the foods tested apart from nitrogenous material, and he had no positive control, such as “sugar plus albumin or gluten.” In his 1816 paper he had written: “Everyone knows that dogs can live very well on bread alone,” but later, when he actually put this to the test he found that “a dog does not live above fifty days.” His final conclusion, still echoed in present-day dietary guidelines, was that “diversity and multiplicity of aliments is an important rule of hygiene; which is, moreover, indicated to us by our instincts”.

At this time there was a controversy as to whether gelatin, obtained by boiling bones, and which was nitrogen-rich, could be used as an economical substitute for meat in French hospitals. Magendie was asked by the Academy of Sciences to carry out further trials to investigate the question. After 10 y of research, which yielded apparently paradoxical results, he had to report that: “As so often in research, unexpected results had contradicted every reasonable expectation.” It was clear that gelatin was not a complete food for dogs, but neither was meat after it had been extracted with water. He suggested that chemists investigate what essential material it was that was leached out of meat: “It could perhaps be iron or other salts, fatty material or lactic acid”. In fact, there was to be a gap of another 75 y before this type of question began to be re-explored in the United States by E. V. McCollum, using the young rat as a more convenient model.

An important, unmentioned assumption behind Magendie's work was that an animal species could be used as a model for humans; in other words, that our bodies were essentially of the same general character as those of animals. This may have arisen, at least in part, as a result of an interest in France for studies in comparative anatomy.

**9. Casmir Funk**

Casimir Funk was born in Poland in 1884.He moved to Switzerland and worked as a biochemist. Biochemists work on the chemical reactions in living things. Casimir Funk discovered four substances which seemed to have very important jobs in the body. He realised that the substances were needed to keep people healthy and to stop them getting diseases. Casimir thought all the substances came from the same chemical family, the amines. These chemicals all have nitrogen and hydrogen atoms in their molecules, often as an
-NH2 group. He announced his discovery in 1912. Casimir called the substances ‘vital amines’. He put the two words together making ‘vitamines’ and later the ‘e’ was taken away making ‘vitamins’. The vitamins Casimir discovered are now called B1 (thiamine), B2 (riboflavin), C (ascorbic acid) and D (cholecalciferol). They are not all amines. Now, at least 15 different vitamins are known. Casimir died in 1967 in the USA.

**10. Christiaan Eijkman**

**Christiaan Eijkman**, (born Aug. 11, 1858, Nijkerk, Neth.—died Nov. 5, 1930, Utrecht), Dutch physician and pathologist whose demonstration that [beriberi](https://www.britannica.com/science/beriberi) is caused by poor diet led to the discovery of [vitamins](https://www.britannica.com/science/vitamin). Together with [Sir Frederick Hopkins](https://www.britannica.com/biography/Frederick-Gowland-Hopkins), he was awarded the 1929 [Nobel Prize](https://www.britannica.com/topic/Nobel-Prize) for Physiology or Medicine.

Eijkman received a medical degree from the University of [Amsterdam](https://www.britannica.com/place/Amsterdam) (1883) and served as a medical officer in the [Dutch East Indies](https://www.britannica.com/place/Dutch-East-Indies) (1883–85). He then worked with [Robert Koch](https://www.britannica.com/biography/Robert-Koch) in [Berlin](https://www.britannica.com/place/Berlin) on bacteriological research and in 1886 returned to [Java](https://www.britannica.com/place/Java-island-Indonesia) to investigate the cause of beriberi. In 1888 Eijkman was appointed director of the research laboratory for pathological anatomy and [bacteriology](https://www.britannica.com/science/bacteriology) and of the Javanese Medical School in Batavia (now Jakarta). Eijkman sought a bacterial cause for beriberi. In 1890 [polyneuritis](https://www.britannica.com/science/polyneuritis) broke out among his laboratory chickens. Noticing this [disease’s](https://www.britannica.com/science/disease) striking resemblance to the polyneuritis occurring in beriberi, he was eventually (1897) able to show that the condition was caused by feeding the fowl a diet of polished, rather than unpolished, rice.

Eijkman believed that the polyneuritis was caused by a [toxic chemical](https://www.britannica.com/science/poison-biochemistry) agent, possibly originating from the action of intestinal microorganisms on boiled rice. He maintained this theory even after his successor in Batavia, Gerrit Grijns, demonstrated (1901) that the problem was a nutritional deficiency, later determined to be a lack of [vitamin](https://www.britannica.com/science/vitamin) B1 (thiamine). Eijkman returned to the Netherlands in 1896 to serve as a professor at the University of [Utrecht](https://www.britannica.com/place/Utrecht-Netherlands) (1898–1928).