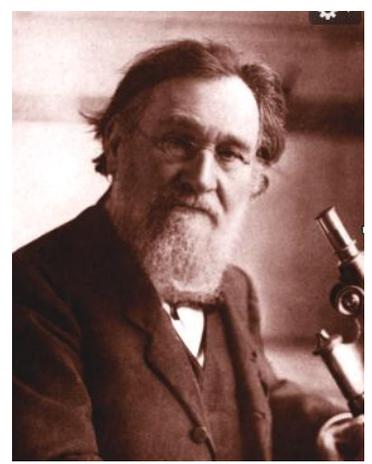


Elie Metchnikoff and his study of longevity



Probiotics for a Long and Healthy Life



By Kerry Pierce, MS

Kerry Pierce is a Technical Support Representative at Hardy Diagnostics.

She earned her Bachelor's and Master's Degrees at Florida State University in Tallahassee. Her studies were focused on molecular microbiology.

Before joining Hardy, Kerry held several college level teaching positions for biology and microbiology.

Kerry takes pride in serving and assisting customers at Hardy Diagnostics and has become involved in various writing and training assignments.

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The study of intestinal flora can be traced back to the early 1900s, when the Russian microbiologist, Elie Metchnikoff began working with Luis Pasteur at the Pasteur Institute in Paris.

It is here that he became increasingly interested in the aging process. His ideas on aging were published in *The Nature of Man* (1903), *Studies in Optimism* (1907), and *Forty Years' Search for a Rational Outlook* (1913).

In 1910, Metchnikoff considered the possible health benefits of fermented foods and proposed a controversial theory of orthobiosis, stressing "[hygienic](#) rules" for prolonging life. He believed the aging process was the result of the proteolytic activity of putrefactive microbes in the bowel and their toxic byproducts.

Bacteria such as clostridia, a normal inhabitant of the gut, is known to produce toxic substances through the breakdown of proteins: including phenols, indols and ammonia. Metchnikoff believed it was these noxious substances that were absorbed by the body in a process of auto-intoxification, resulting in the degenerative processes associated with aging.

During his studies, Metchnikoff observed that the longest-lived and most vital people in the world, including the Hunzas of Kashmir and the Georgians in Eastern Europe, regularly ate some form of fermented food. In particular, he studied Bulgarians who had an exceptionally long average life-span in the early 1900s of 87 years; moreover, he found that four out of every thousand Bulgarians lived past 100 years of age.

One of the significant differences of their lifestyle was that they regularly consumed large amounts of fermented milks. In more recent times, Georgians of 100+ years have been known to participate in events typically reserved for younger generations, such as polo games and farm field labor.

Georgians are particularly strong believers in the benefits of eating fermented foods and they have a popular slogan which states: “IF YOU WANT TO LIVE LONG, DRINK MORE SOUR MILK.”

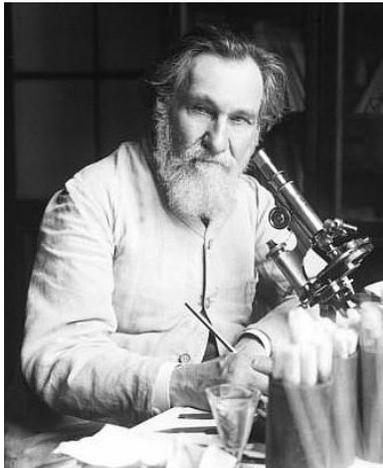


Figure 1: Metchnikoff studied various ethnic cultures noted for their longevity in an attempt to discover what it was about their diet that they shared in common.

Throughout the early 1900s, Metchnikoff inspired a surge in the consumption of fermented milks. He proposed that consumption of fermented foods would 'seed' the intestines with beneficial

bacteria and counteract aging. These bacteria he called “Bulgarian Bacillus” were believed to hold the benefits to good health.

Friends in Paris soon noticed Metchnikoff’s personal health improving through diet and they followed suit; physicians, too, began prescribing the sour milk diet to their patients around the same time.

For many years, society popularized the health benefits of fermented foods. It was not until 1921, when research conducted by Rettger at Yale University showed that Bulgarian Bacillus, later called *Lactobacillus bulgaricus*, could not survive in the human gut. Consequently, the fermented food phenomenon soon waned and people began to doubt Metchnikoff’s theory of longevity.

Since the 1920s, scientists have continued to investigate the potential benefits of healthy gut flora. In 1935, strains of *Lactobacillus acidophilus* were found to sustain activity when implanted in the human digestive tract.

In addition, research over the past forty years has found more compelling evidence of the health benefits associated with beneficial intestinal bacteria: factors such as good

digestion, effective detoxification, reduction in food allergies and prolonged health appear to be promoted after establishing a healthy balance of beneficial bacteria in the gastrointestinal tract.

Despite frequent opposition during his lifetime, Metchnikoff became a renowned scientific figure whose ideas continue to have long-lasting effects.

In 1908, he shared the Nobel Prize in medicine with Paul Ehrlich for his numerous works on the processes of immunity, including his work on describing the process of phagocytosis in white blood cells.

He died on July 16, 1916, at the age of 71. Of all the bacterial families researched since the advent of his theory, the Lactobacilli family has received the greatest attention.



Figure 2: Today, many commercial food companies capitalize on the idea of Probiotics for the promotion of intestinal health. The term “probiotic” was introduced in 1953 as a contrast to “antibiotic.”

Two of the more common forms, *Lactobacillus*

acidophilus and *Bifidobacterium*, have been at the forefront of this research. However, new studies show the *L. casei* form as having promising digestive benefits.

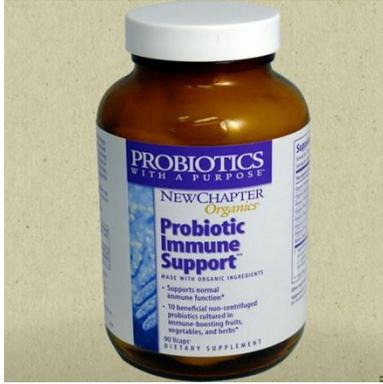


Figure 3: Various probiotic supplements on the market today consist mainly of freeze dried bacteria made up of various species of *Lactobacillus* and *Bifidobacteria*.

Consequently, Metchnikoff's early theory on probiotics persists to this day and research continues to document the beneficial effects bacteria play in balancing human digestion: an area that certainly contributes to vitality and good health overall.

Kerry Pierce
Santa Maria, California