



Preclinical Studies Highlight

BONE BROTH'S MULTI-FUNCTIONAL POTENTIAL

Bone Broth Aids Microbiome, May Help Migraine Sufferers

Rising public interest in bone broth, driven by renewed interest in collagen for healthy and active lifestyles, increased retail sales in dollars threefold to \$19.7 million from 2015-2016.¹ This presents a significant growth opportunity for food and beverage marketers. Bone broth is enjoyed by consumers as a food or beverage and is touted by [athletes](#) and [nutrition experts](#) for its myriad health benefits. Increasingly, it is regarded by many as a nutritious source of protein and collagen.

Collagen, traditionally viewed as a supplement for hair and joints, is now seen as a generally nutritious source of quality protein. From 2017 to 2018, sales of collagen products to individuals who use protein supplements increased 751%, totaling \$8.7 million.² These early adopters are important influencers of broader nutrition trends and should be key targets for food and beverage brands.

¹SPINS MULO (multi-outlet), Natural channel and Specialty Gourmet channel, 52 weeks ending Jan 22, 2017 | ²Ibid

As consumer awareness of bone broth grows, so does the body of research about its health benefits. This white paper highlights two recent preclinical studies from the Center for Biomedical & Life Sciences at Missouri State University (MSU). The findings suggest that **enriched chicken bone broth from International Dehydrated Foods (IDF) may be beneficial for maintenance of gut microbiota and as therapy for chronic migraine headaches**, two benefits that have previously not been widely recognized. These preclinical data on this specially developed chicken bone broth present promising opportunities for marketing additional health benefits of food and beverage applications that utilize it. **Of the many broths tested to date, only IDF's enriched chicken bone broth has had these positive results**, which include reducing COX-2 and protein kinase A (PKA) inflammation markers, as well as increasing probiotic organisms like Lactobacillus. This special enriched chicken bone broth has more chondroitin and collagen than other bone broths.

DIGESTIVE HEALTH

In a 2016 preclinical [study](#), MSU researchers fed rodents IDF's bone broth and effectively increased the presence of [symbiotic](#) (probiotic) gut bacteria. According to the study, these bacteria are "reported to aid in overall digestive health, decrease inflammation, mitigate the disruptive effects of antibiotics, and reduce the number of sick leave days in adults."³ The research also suggests that bone broth may have value as a prebiotic therapy for a number of stress-related ailments.

Other research suggests that bone broth may have health-beneficial applications for people of all ages, from infants to adults. One such [study](#) shows potential to aid microbiome development and reduce constipation in babies and young children. Another [study](#) demonstrates that probiotic and prebiotic treatments may be beneficial for patients with liver disease. Yet [another](#) shows the power of prebiotics to help with weight management.

The digestive health category is rapidly growing, with probiotics and prebiotics leading the trend. Survey data from market research firm [DSM](#) suggest that 29% of Americans are aware of a relationship between prebiotics, digestion, and gut flora. Sales of prebiotics supplements have grown more than 120% in the past three years, according to [data](#) from *Nutrition Business Journal*. This period of accelerated growth in awareness of probiotics and prebiotics is an opportunity for food and beverage brands to reach new audiences and stand out on the store shelf by appealing to consumers' concern about digestive health.

PAIN MANAGEMENT FOR MIGRAINES

Migraine is a common neurological disorder that can cause recurring periods of throbbing headaches, debilitating pain, nausea, and heightened sensitivity to light and sound. The disease is believed to be hereditary and can affect both children and adults. According to the [Migraine Research Foundation](#), nearly one-quarter of households in the U.S. include



³Hawkins, Jordan, Norton, Rhy and Durham, Paul. "Inclusion of Chicken Broth AAC1 as a Dietary Supplement Modulates the Gut Microbiome: Results of Next-Generation DNA Sequencing" (2016). The FASEB Journal 2016 30:1_supplement. 854.3-854.3



someone who experiences migraines. A second recent [study](#) from MSU suggests that managing migraine pain is another potential therapeutic use of this special bone broth.⁴

Researchers set out to test if a diet enriched with this bone broth would affect the sensitivity of pain receptors called trigeminal neurons when stimulated by mechanisms known to trigger migraines. These [neurons](#) compose the trigeminal nerve, which affects the tendons and muscles, as well as the face and teeth. Those who suffer migraines, in general, have a disorder of the trigeminal nerve.

In the MSU study, rodents were fed a diet enriched with high-collagen chicken bone broth donated by IDF. Samples of this group's serum and DNA from intestinal microbiota were compared against those of control groups. Rodents that were fed a diet supplemented with chicken bone broth showed reduced activation of the trigeminal receptors related to pain and migraines.

MSU's researchers concluded that "dietary inclusion of [bone broth] provides a novel non-pharmacological method for modulating [pain receptors] and thus reducing the risk of developing migraine." The authors hypothesize that the combination of antioxidant and

microbiome effects makes bone broth effective at regulating trigeminal activation and potentially reducing migraine onset and symptoms.

GROWTH OPPORTUNITIES

Possibilities abound for food and beverage marketers looking to attract consumers by formulating new and innovative applications with the right bone broth. For example, drinkable soup is a hot (or chilled) trend. Served in bottles and stand-up pouches, drinkable soup is a nutritious, portable meal that appeals to busy parents and professionals.

Bone broth can fortify drinkable soups and other applications with collagen, protein, and electrolytes, which are sought after by health-conscious consumers. The recent clinical data from MSU researchers demonstrate additional multifunctional benefits of collagen-enriched bone broth developed exclusively by IDF.

As the industry leader in chicken bone broth, IDF offers shelf-stable concentrates, frozen concentrates, and powdered bone broth varieties. Visit [IDF.com](https://www.idf.com) to learn more about formulating with chicken bone broth or to request a sample.

⁴Durham, Paul L. & Hawkins, Jordan L., 2018, 'Enriched Chicken Bone Broth as a Dietary Supplement Reduces Nociception and Sensitization Associated with Prolonged Jaw Opening', *Journal of Oral & Facial Pain and Headache*, vol. 32, no. 2, pp. 208-215.

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