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The Future of Edible Bird's Nest as a Neutraceutical and Pharmaceutical Animal Bioproduct

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Editorial

Edible Bird's Nest (EBN) is the dried saliva of swiflets that are found mainly in Malaysia, Indonesia, Thailand, Philippines and Vietnam. Only the nests produced by the four swiftlet species *viz. Collocalia fuciphaga, Collocalia germanis, Collocalia maxima* and *Collocalia unicolor* are important commercially due to their health benefits when consumed by humans. EBN has different names in different languages such as *Yan Wo* in Chinese, *Sarang Walet* in Indonesian and *Enso* in Japanese. EBNs are classified as cave and house nests depending upon the origin of the nests regardless which species of swiftlets has built the nests. Nests are graded on account of their dry mass, the time spent by swiftlets in nest building, and their fat and protein content. On this basis, nests are generally classified as white, black and blood nests. White nests have major contents of saliva, while the black nests contain around 45-55% feathers and small dried leaves. The third class belongs to partially or completely dull orange red to brownish red nests. Such nests are called *Xueyan* or *Xueyanwo* in Chinese or red blood nests in general. Blood nests are believed to have better health values and thus, fetch a higher price than white and black nests in the market.

The history of EBN trade can be traced back to the times of Tang Dynasty (618-907 A.D.) in China. However, certain evidences indicate that EBN trade began in 1589 when Ming Dynasty ruled the ancient Chinese Empire. Such was the prestige of EBN that only the families of the emperor and his ministers had the wealth and priority to consume it during the ancient Chinese civilization. Nowadays, consuming EBN is regarded as a social status because of the high price of the nests. The delicious, nutritive and wellness properties of EBN increased its fame among people. Presently, EBN is believed as one of the most popular delicacies among the Chinese communities.

The main target markets for EBN trade are the Chinese communities all over the world. However, Mainland China, Hong Kong and Taiwan are the other top consumers of this product followed by Singapore, U.S.A. and Middle East countries, among others. EBN soup is an esteemed cuisine for upper class Chinese, and they largely appreciate EBN for its health benefits. In Hong Kong restaurants, each bowl of the bird's nest soup costs around 30-100 USD. There is always a stable demand for EBN from the restaurants, and the demands reach their peak values during the Chinese New Year. Chinese usually practice the gifting of EBN during New Year as it is thought as a gesture of good health and longevity wishes for the recipient. Besides, it also serves as a symbol of social status. Of course, EBN soup has been a core part of Chinese tradition and culture for hundreds of years now. Appropriately, the increase of wealth in the Asian region along with an increase in the price of a bowl of EBN soup has made EBN the "Caviar of the East".

Proteins are one of the main ingredients of EBN. Proteins are crucial to the building and repair of body cells and tissues, and also driving other metabolic functions. Carbohydrates are also found in adequate quantities in EBN. One of the prominent carbohydrate components found in EBN is sialic acid. Sialic acid facilitates the distribution and structure of gagliosides in brain. In addition to the above ingredients, EBN is a rich source of essential trace elements like calcium, phosphorus, sodium, potassium, iodine, iron, and some essential amino acids. Recently, some vitamins, growth factors, anti-oxidants have also been found in certain EBN samples. In nutshell, EBN is a nutritive and restorative food appropriate for consumption by all age groups of all genders.

The system of Traditional Chinese Medicine is of the belief that EBN has highly encouraging effects for the cure and treatment of consumptive diseases, difficult breathing, dry coughs, alleviating asthma, tuberculosis, hemoptysis, asthenia, improving voice, stomach ulcer, relieving gastric troubles and general weakness of bronchial ailments. EBN is also helpful for the proper and healthy nourishment of kidneys, heart, lungs and stomach. It also helps in raising libido, promoting growth, fortifying the immune system, improving concentration and skin complexion, slowing down the aging processes, increasing energy and metabolism, and regulating circulation. The daily intake of EBN has been observed to ensure high spirited physical and mental strength, and youthfulness restoration. Recently, EBN has been shown to exhibit some interesting biological properties such as anticancer, antiviral, bone strengthening, eye caring, neuroprotective and anti-oxidant and skin nourishing. EBN also potentiates the proliferation of human adipose derived stem cells (HASCs). Infact, epidermal growth factor (EGF) like activity has been documented for EBN in several *in vitro* experiments.

Till now, several functional food and cosmetic products have been developed by the use of EBN as an active ingredient. Some functional beverages with skin-improving, healing, immunopotentiation and anti-aging effects have been prepared and tried with very good response from public. Additionally, several energy boosting products containing EBN have been developed with good response from the consumers. Some cosmetic products have also been prepared using EBN as one of the main ingredients. For example, skin-whitening/moisturizing eye masks for moisturizing and nourishing skin around eyes have been prepared. EBN has also found use as an important component for the preparation of Chinese medical formulation for treatment to nephritis. Indeed, several neutraceutical and pharmaceutical products based on EBN are in their developmental stages.

Overall, EBN is a rich source of very important health promoting constituents like amino acids, proteins, carbohydrates, fatty acids and minerals. This is why EBN has taken the shape of different kinds of food products such as drinks and food additives. Of course, EBN has been reported previously for anticancer, antiviral, bone strengthening, eye caring, and cell proliferating properties, however, these studies are very preliminary

and therefore, further scientific research in this direction is encouraged. Besides, it is not known clearly, which of the components are responsible for a particular biological action. Thus, it is needed that more research be done for further exploring the biological and medicinal properties of EBN. There is a great need to study the correlations between the components and the functions of EBN so that some new and exciting compositions may be discovered. If all this happens smoothly and with success, then, we can safely foresee a bright future of EBN as a neutraceutical and pharmaceutical animal bioproduct.