

### **SNF-BV1™** Bovine Protein Extract

#### **Promotes Health, Enhances Immunity\***

The constituents of the nasal secretions (NS) are similar in all mammals. These constituents are derived from various cell sources within mucous membranes and work efficiently at protecting the mucosal surface of the host. The induction of constituents in the NS help control infectious agents and augment initiation of systemic immune responses.

The respiratory tract in mammals begins at the points of air intake, the nose and the mouth, and extends to the air exchange surface of the alveoli. The respiratory mucous membranes, so named for their capacity to generate mucus, begin at the nasal vestibule and continue through the nose, pharynx, larynx, trachea, bronchi, and bronchioles. The primary functions of the mucous membranes are to serve as a physical barrier protecting the respiratory tract and to produce NS. These tissues represent the site of initial interactions with elements of the innate immune system and provide a critical epithelial border against noxious, toxic or infectious substances.

The NS and their constituent proteins are derived from epithelial cells (including goblet cells), submucosal glands (including both serous and mucous cells), secretory cells resident in the mucosa (including plasma cells, mast cells, lymphocytes, and fibroblasts) and plasma. Thus, respiratory secretions consist of a mixture of mucous glycoproteins, glandular products, and plasma proteins. The NS physically protect the mucosa and provide essential host defenses.

The NS are a complex mixture containing more than 70 constituents (table provided upon request). The major component, the mucous glycoprotein, is a large molecule consisting of a protein core to which multiple long-chain polysaccharides are attached. The individual glycoprotein molecules polymerize to form a family of proteins varying in size up to  $2 \times 10^7$  daltons. The mucous floats on the epithelial lining fluid (ELF), which exists in the space between the surface of the epithelium and the tips of the cilia.

\*These statements have not been evaluated by the Food and Drug Administration.  
This product is not intended to diagnose, treat, cure or prevent any disease.

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Although the mucus itself is rapidly transported to the pharynx and swallowed, the ELF layer appears to be quite stable, providing a pool of molecules on the surface of the epithelium that can interact with any foreign proteins that manage to penetrate the mucous coating and reach the mucosa.

Stimulation of mucous membranes results in an outpouring of fluids capable of preventing or limiting infections, neutralizing toxins that may impact on the secretions, and eliminating particulate materials that are trapped within the mucous layer. Most mammals have a limited number of viral and bacterial infections of their respiratory mucosa, an observation which speaks well of the effectiveness of the host defense mechanisms involved.

Albumin, lactoferrin, lysozyme, secretory leukoprotease inhibitor, and immunoglobulins are normally the major components of the NS during health or disease. Many other constituents are also present, but most are present in low concentrations. Of interest are those constituents, such as cytokines, which may not normally be present or are present in low concentrations in NS, but, appear in NS early or increase in concentrations after infection or shortly after exposure to a noxious or infectious agent (including vaccination). While one may view such constituents simply as biological markers of exposure, we contend that certain constituents play a more central role in host defense and act as triggers of systemic responsiveness. It is our hypothesis that upregulation of specific cytokines in the NS is an immunological signal identifying an inhalant as infectious or capable of causing tissue injury and that cytokine-generated signal results in an appropriate systemic physiologic or immunologic response.

The bovine extract, **SNF-BV1™**, is harvested and provided as a dietary supplement. **SNF-BV1™** promotes health and enhances immunity. For additional information and developmental samples, please call (806-376-1741 ext. 13) or FAX (806-376-9301).

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