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- (54) **SEAWEED SUPPLEMENT DIET FOR ENHANCING IMMUNE RESPONSE IN MAMMALS AND POULTRY**
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- (52) **U.S. Cl.** ..... **424/442**; 424/195.17; 514/885
- (58) **Field of Search** ..... 424/439, 442, 424/575, 195.17; 514/885; 426/2, 53, 635

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

5,229,118 A \* 7/1993 Campbell ..... 424/195.1

**FOREIGN PATENT DOCUMENTS**

BE 626884 \* 1/1963  
JP 5440176 \* 3/1979

**OTHER PUBLICATIONS**

Effects of dietary *Ascophyllum nodosum* on blood parameters of rats and pigs Jones. et al Bot. Mar. (1979), 22(6), 393-4, 1979.\*  
Efficiency of fucans in protecting porcine endothelial cells against complement activation and lysis by human serum Charreau, etal Transplant. Proc. (199 ), 29(1/2), 889-890, 1997.\*

Iodine requirement of weaning piglets of southern Belorussian SSR Lemesh, V. F.; Prokoshin, A. A. USSR Vestsi Akad. Navuk Belarus. SSR, Ser. Sel'skagaspad. Navuk (1970), (2), pp. 105-9, 1970.\*

Kim, C. S., et al., The Effect of Dietary Sargassum-Natans and Ascophyllum-Nodosum on Salmonella Gallinarum Infection in Chicks, BIOSIS (AN 1969:8848).

Herskoviz, R., et al., Differential effects of Polysulfated polysaccharide on experimental encephalomyelitis, proliferation of autoimmune T cells, and inhibition of heparanase activity, BIOSIS (AN 1996:22174).

Matsuzaki, S., et al., Application of seaweeds to human nutrition and medicine CA (AN97:4974).

Nishizawa, K., Seaweed as food for controlling diseases in elderly patients, CAPLUS (AN 1998:590009).

Kim, C. S., The Effects of Dietary Sargassum-Natans and Ascophyllum-Nodosum on Salmonella-Gallinarum Infection in Chicks, BIOSIS (AN 1973:82740).

(List continued on next page.)

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(57) **ABSTRACT**

Seaweed supplement is included in diet of mammals and poultry to enhance immune response. In one embodiment, pasture forage is treated with seaweed supplement. When cattle or lambs are grazed on seaweed supplement treated endophyte-infected forage, immune function is preserved or depressed immune function is reversed. The enhanced immune function continues to the feedlot finishing phase even though no seaweed supplement is fed in that phase. In an independently inventive embodiment, seaweed supplement is administered to pigs exposed to PRRS disease to impart resistance to said disease and improve performance. In still another independently inventive embodiment, seaweed supplement is administered to lactating mares prior to weaning to mitigate the stress of weaning.

**8 Claims, 21 Drawing Sheets**

