

What is a Beta Glucan?

Kraig Peel, PhD

When the United States started feeding cattle in feedlots to increase efficiency, we ushered in a new era in animal production. When we put cattle in pens and in close proximity, we increased the incidence of diseases which gave rise to a new industry of pharmaceuticals to combat illness in these animals. Many of these products were developed to keep the animal healthy without adequate regard to the downstream effects on human health. As the public began to realize the use of these products, there began a movement to remove these products from use in animal feeding. The only way to produce this protein at the price point that the consumer is willing to pay is to continue to maximize efficiency and continue to utilize the existing feedlot/dairy structure of confinement. The use of antibiotics have become scrutinized and even banned by some companies. McDonalds has stated they will no longer buy beef that has been treated with antibiotics. This shift in management has spurred the development of a new line of immune enhancing or at least pathogen binding products. These products are designed to assist the natural immune response in the animal or to attach to the pathogenic organisms and not allow their absorption into the bloodstream of the animal which would cause illness. One such product that we will focus on is Beta Glucan.

Beta Glucan can be described or classified as an immune modulator. An immune modulator is a substance that has been shown to have the ability to modify/enhance the immune system of a person or an animal to a pathogenic threat. Beta Glucan activates the natural occurring white blood cells of the immune system to serve to increase resistance to bacterial, fungal, parasitic infections and has been shown to assist in decreasing tumor growth. The beta glucan is used by the white blood cell to occupy receptor sites which activate the cell's ability to combat a health challenge. The white blood cells are activated but not overly stimulated.

There are several sources for beta glucan and there are many products available as feed additives on the market today for use in livestock feeds. There are sources from bakers yeast, barley, oats and mushrooms. The most effective (and most expensive) is the fungal origin which comes from mushrooms. The B1,3-D B1, 6-D-glucan from mushrooms is more effective than the B1, 3-D-glucan configuration. The reason is because it is a three stranded molecule with more surface area for binding which increases effectiveness. Most beta glucan comes from baker's yeast or impure beta glucan which do not have full white blood cell or macrophage activating ability.

There is significant ease of use with beta glucan. The product can be included in a dry mixture of animal feed and can be combined with a typical dry or liquid mineral mix that is included in a TMR (total mixed ration). Beta glucan is acid resistant and passes through the rumen fermentation unchanged. The intestine of farm animals lacks a specific enzyme that would break up the molecule and render it ineffective. Beta glucan is naturally occurring and does not present any opportunity to be incorporated into the meat or milk of production livestock.

The public is requiring that we use less antibiotics in animal feeds. Much of this demand is centered around the emergence of antibiotic resistant bacteria. The science and proof of where and how these bacteria have become immune to most of our current antibiotics remains

mixed. Much of the resistance has originated from the over prescription of antibiotics by doctors. The next level of blame comes from misuse by people. Most of use start off with good intentions of taking all of our antibiotics. It is easy to remember when we are sick but when we start feeling better we tend to forget doses and then stop taking it all together which only educates the bacteria to be resistant. I agree with using naturally occurring methods to boost animal performance and resistance to morbidity. Beta glucan is a product that has proven to be beneficial to the animal by boosting the immune system and hopefully preventing the animal from become ill during production of meat and milk.

Over the years, many substances have been identified and studied for their immunostimulatory activities. However, most of them cannot be used in domestic food animals due to cost, toxicity, undesirable side effects, or safety concerns for the consumer. Research has shown beneficial effects on the stimulation of the immune system by compounds of microbial or plant origin such as, β -glucans, with the potential to minimize the incidence of disease in livestock.