



## Ingredients Selected by Efficacy—Not by Name

Every OmniGen® product features natural silicates and yeast components, like silicon dioxide, calcium aluminosilicate/sodium aluminosilicate and brewer’s dehydrated yeast. While other products may feature ingredients of the same name, these general classifications of ingredients vary significantly in chemical composition and, subsequently, in biological activity.

### Where Chemistry Intersects with Biology—Ingredient Selection.

Here at Phibro, our technical team developed and optimized a two-pronged research approach for our nutritional feed additives. Our **Material Science Group** determines the most basic building blocks of each ingredient and quantifies them. The **Biological Research Group** then uses proprietary *in vivo* models to evaluate those ingredients, allowing us to measure the biological impact. This provides an approach to identifying the optimal ingredients and then to easily use chemistry to monitor the composition of those ingredients, ensuring consistency and reliable performance.



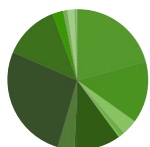
*The OmniGen Family of nutritional specialty products has been shown in research trials to help support a healthy immune system as your cows may face immunological stressors. With OmniGen to support the immune system, you can help reduce health issues, reduce the need for antibiotic usage and improve milk production.*

### Same Ingredient Name. Similar Makeup. Different Impact on Immune Function.

As an example, these pie charts show relative concentrations of the chemical compounds of an ingredient selected for OmniGen compared to ingredients in alternative products

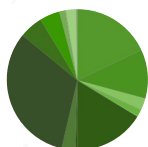
#### SIMILAR CHEMISTRY MAKEUP BUT DIFFERENT RESULTS

OMNIGEN INGREDIENT



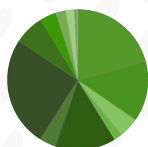
**100%**  
OF MARKERS  
IMPACTED

ALTERNATE A



**62%**  
OF MARKERS  
IMPACTED

ALTERNATE B



**37%**  
OF MARKERS  
IMPACTED

with the same name and similar compositions. While their overall chemical composition is similar, the numbers below the charts show significant differences in the abilities of these three ingredients to impact immune and biological processes in the animal.

### Proprietary *In Vivo* Models Reveal the Difference.

At Phibro, we’ve developed proprietary *in vivo* models that allow us to differentiate the biological effects of these ingredients, even when the chemistry is very similar.

Using these models, animals are fed a basal diet with the current OmniGen formulation or a basal diet with a single ingredient substituted into OmniGen. After the feeding



period, we evaluate eight carefully chosen, predictive immune biomarkers that give us a clear picture of ingredient efficacy on the adaptive and innate immune system, as shown in the table.

Immune Biomarker	OmniGen Ingredient Supports	Alternate Ingredient A	Alternate Ingredient B
Immune Cell Activation	+	-	+
Tissue Healing	+	+	+
Protein Synthesis	+	+	-
Pathogen Recognition	+	+	+
Immune Cell Recruitment	+	-	-
Gene Transcription	+	+	-
Anti-Inflammatory Mediation	+	-	-
Cellular Protection	+	+	-

**+** Indicates Positive Change    **-** Indicates Negative or NO Change

### We Don't Stop There.

Phibro has compiled more than 110 research publications that demonstrate the benefits of feeding OmniGen in support of health, productivity and reproduction.



Our deep understanding of the chemical composition of our ingredients, coupled with *in vivo* models that reveal their biological responses, ensures that OmniGen performs as expected day in and day out. At Phibro, we continue to invest in livestock research to ensure the success of our customers' operations.



Learn more about our OmniGen family of products at [TheOmniGenDifference.com](http://TheOmniGenDifference.com)