

Technical Bulletin

Information from Phibro Technical Services

OmniGen™ Pro – a Nutritional Strategy for Healthy Cows and Healthy Profits

OmniGen Pro helps cows be and stay healthy and improves dairy profitability by increasing income and reducing costs. There have been scores of research reports showing OmniGen helps improve health and performance. OmniGen Pro includes the OmniGen foundation along with functional metabolites and essential precursors, created from Phibro's exclusive fermentation technologies.

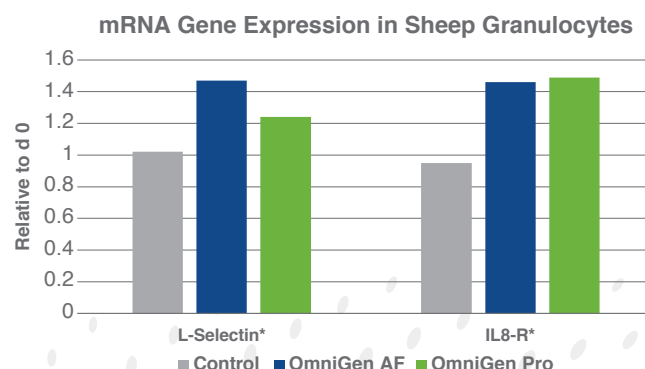
Recent research indicates OmniGen Pro provides similar immunological responses as the OmniGen foundation. This gives us confidence that feeding OmniGen Pro will have comparable effects on animal immunity and health as previously demonstrated with OmniGen AF.

OmniGen Pro - Maintains Immune Competency

In a 2019 study completed at Phibro's Corvallis Research Center, sheep were fed no OmniGen, 6 g OmniGen AF, or 6.75 g OmniGen Pro daily. After 23 days of feeding, and 3 days of daily dexamethasone injections (a glucocorticoid which suppresses immune function), blood samples were obtained from all sheep for measurement of immune competence. Results from blood samples obtained at d 0 serve as the baseline for these measurements.

Several biomarkers of immune function were used to assess the effects of OmniGen on immunity, including mRNA gene expression of L-selectin (associated with neutrophil margination) and gene expression of IL8-R (related to neutrophil migration). Gene expression is a measure of the ability of cells to produce the proteins coded for by the specific DNA sequence. Elevated gene expression of these immune markers when OmniGen is fed suggests there are increased concentrations of these proteins, which enhance immune function.

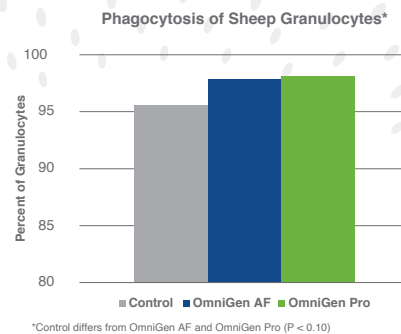
At d 23, granulocytes (neutrophils, basophils, and eosinophils) isolated from the blood of sheep fed



OmniGen AF and OmniGen Pro had higher L-selectin and IL8-R gene expression than granulocytes from control-fed sheep. This is an expected response to OmniGen in animals receiving dexamethasone.

Based on finding higher L-selectin and IL8-R gene expression by sheep fed both OmniGen AF and OmniGen Pro compared to control-fed sheep, **feeding these OmniGen products improves immune cell responsiveness** (higher L-selectin) and **protects immune cells from stressors** (higher L-selectin during exogenous glucocorticoid administration).

Granulocytes were exposed to *E.coli* bacteria and phagocytosis was measured using flow cytometry, a technique used to detect and measure physical and chemical characteristics of immune cells. Increased percentages of phagocytosing granulocytes is an indication of **improved immune cell function**.



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At d 23, after 3 days dexamethasone injections, granulocytes from sheep fed OmniGen AF or OmniGen Pro had a higher percentage of phagocytosis, than granulocytes from sheep fed the control diet.

Greater phagocytosis following dexamethasone injections indicates sheep fed OmniGen products had **improved ability of immune cells to seek out and kill pathogens**, and that **immune cells were protected from stressors**.

Results from this Sheep Study Indicate that Animals Fed OmniGen Pro:

- Have better immune cell responsiveness than controls, based on increased L-selectin and IL8-R gene expression.
- Have improved ability of immune cells to seek out and kill pathogens, based on greater phagocytosis and oxidative burst intensity in an *in vitro* culture.
- Have immune cells that are protected from stressors, based on improved immune marker responses and immune cell function during immunological and pathogen challenges.

These results indicate that the mechanism of action of OmniGen Pro is consistent with the immunological principles previously determined for the OmniGen foundation. This gives us confidence that feeding OmniGen Pro will have comparable effects on animal immunity and health as previously demonstrated with OmniGen AF.

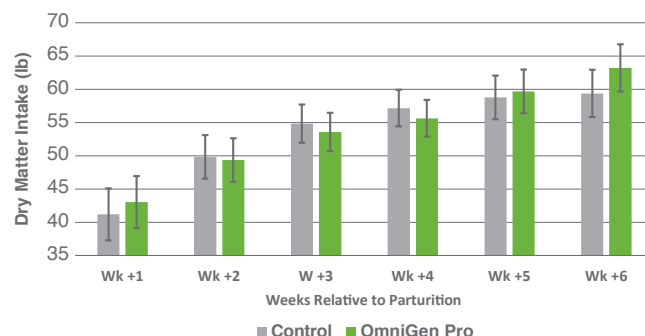
OmniGen Pro – Enhances Transition Cow Performance

Another recent study conducted in 2019 in Wisconsin demonstrates OmniGen Pro improves dairy profitability by increasing income from higher milk yield. A dairy cow study was recently completed using OmniGen Pro at an independent, contract dairy research facility. Late lactation, multiparous Holsteins were used in the study, with 8 animals per treatment group. Cows were fed a control diet or 63 g OmniGen Pro from dry-off through 42 days in milk. Cows were housed in groups and fed individually.

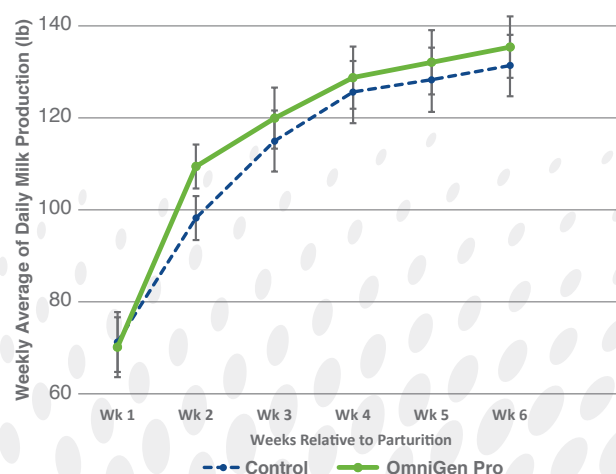
There were no statistically significant differences between treatments for prepartum or postpartum intake in this study. Intake during the dry period averaged about 31 lbs dry matter per cow per day. Post-partum intake was similar for treatment groups.

This information has been prepared for industry technical professionals.

Dry Matter Intake by Cows Fed With or Without OmniGen Pro



Milk Yield by Cows Fed With or Without OmniGen Pro



There were no statistically significant differences between treatment groups for milk yield, which is not surprising given the low number of animals per treatment. However, milk production was numerically higher (on average 4.3 lbs per day in first 42 days in milk) for cows fed OmniGen Pro compared to cows fed control.

The improvement in milk production in this initial study indicates OmniGen Pro can improve dairy profitability by increasing milk income through higher milk yield.

Conclusion:

These studies indicate OmniGen Pro provides similar immunological responses as the OmniGen foundation (giving us confidence that feeding OmniGen Pro will have comparable effects on animal immunity and health as previously demonstrated with OmniGen AF), along with improved milk production for higher milk income.