



OmniGen[®]

OmniGen[®]
Research Publications
2003-2020 vol. 4

HEALTHY ANIMALS. HEALTHY FOOD. HEALTHY WORLD.®

Phibro
ANIMAL HEALTH CORPORATION™

OmniGen® Research Publications 2003-2020

The OmniGen family of nutritional specialty products from Phibro, is a portfolio of unique, patented products recommended to be fed to dry, pre-fresh and lactating cows every day to help support healthy immune function in the face of expected and unexpected stress events.

Phibro recognizes that there are various agents and stressors that cause the immune system of dairy cattle to become suppressed, or temporarily dysfunctional. During those periods, cows may become more susceptible to metabolic disorders, intra-mammary and other infections, and experience compromised milk production.

This collection of over 113 published university research and field studies show that continual use of OmniGen helps support a healthy immune system, which may lead to fewer health events, lower somatic cell counts and fewer cases of mastitis and metritis. With healthy immune function, dairy cattle are better prepared for stressors reducing the need for antibiotic and other costly treatments, helping cows achieve their full potential while optimizing production costs and overhead.

Immune Marker Studies (4)	page 3
Neutrophil Function Studies (9)	page 4
Immune Modulation Studies (15)	page 6
Challenge Studies (13)	page 8
Milk, Milk Quality and Herd Health Studies (18)	page 10
Heat Stress Studies (19)	page 12
Reproduction Studies (7)	page 15
Calf & Heifer Studies (5)	page 16
Beef Cattle Studies (9)	page 17
Small Ruminants Studies (4)	page 18
Other Studies (10) including gene profiling and microarray analysis	page 19

Immune Marker Studies

Armstrong, S. A., D. J. McLean, T. H. Schell, G. Bobe, and M. Bionaz. 2015. ***OmniGen-AF affects expression of immune-related genes in whole blood of healthy Angus heifers.*** J. Dairy Sci. 98(Suppl. 2):22. (Abstr.)

Branson, J. A., D. J. McLean, N. E. Forsberg, S. A. Armstrong, T. H. Schell, and G. Bobe. 2014. ***Identification of immune response markers to OmniGen-AF supplementation in a rat model.*** J. Dairy Sci. 97(E-Suppl. 1):423. (Abstr.)

Corbett, R. B., J. D. Chapman, and Y. Q. Wang. 2008. ***Effect of OmniGen-AF on immune markers and neutrophil function in lactating dairy cows.*** Page 280 in Proc. Am. Assoc. Bovine Pract. (AABP), 41st Annual Conference. Charlotte. Frontier Printers Inc., Stillwater, OK.

Marins, T. N., J. O. S. Calix, R. M. Orellana, J. K. Bernard, M. Garcia, D. J. McLean, J. D. Chapman, D. J. Kirk, and S. Tao. 2019. ***Effect of withdrawing OmniGen-AF from lactating cow diet on performance and peripheral blood mononuclear cells proliferation.*** J. Dairy Sci. Vol. 102(Suppl. 1):235. (Abstr.)



Neutrophil Function Studies

Forsberg, N. E., Y. Wang, S. Puntenney, and J. Burton. 2007. ***Effects of an immunostimulatory feed additive on neutrophil function and development of titer in ruminant livestock.*** J. Dairy Sci. 90(Suppl. 1):392. (Abstr.)

Ortiz-Marty, R. J., N. E. Forsberg, J. D. Chapman, and I. K. Mullarky. 2012. ***Neutrophil function restoration by OmniGen-AF.*** J. Dairy Sci. 95(Suppl. 1):397. (Abstr.)

Ortiz-Marty, R. J., A. Lewandowski, J. D. Chapman, and I. Kanevsky-Mullarky. 2017. ***A commercial immune modulating feed additive restores L-selectin and CCL5 expression following dexamethasone treatment of murine immune cells in a MyD88-dependent manner.*** J. Dairy Sci. 100:6422-6428.

Revelo, X. S., J. W. Davis, R. D. Schnabel, A. L. Kenny, N. M. Barkley, and M. R. Waldron. 2013. ***Effect of an immunomodulatory dietary supplement on the global gene expression profile of neutrophils from periparturient dairy cows.*** J. Dairy Sci. 96(E-Suppl. 1):485. (Abstr.)

Rill, C.R., T. Lu, J. E. Williams, B. Hatch, B. Shafii, P. Rezamand, J. D. Chapman, and M. A. McGuire. 2010. ***Effect of dietary OmniGen-AF on milk somatic cell count and the ability of isolated blood neutrophils to kill pathogens.*** J. Dairy Sci. 93(E-Suppl. 1):724. (Abstr.)

Rowson, A., Y. Wang, N. E. Forsberg, and S. Puntenney. 2009. ***Effects of feeding OmniGen-AF on phagocytic ability of neutrophils isolated from dairy cattle, rats and mice.*** Page 227 in Proc. Am. Assoc. Bovine Pract. (AABP), 42nd Annual Conference. Omaha. VM Publishing Comp., Stillwater, OK.

Ryman, V. E., S. C. Nickerson, F. M. Kautz, D. J. Hurley, L. O. Ely, Y. Q. Wang, and N.E. Forsberg. 2013. ***Effect of dietary supplementation on the antimicrobial activity of blood leukocytes isolated from Holstein heifers.*** Res. Vet. Sci. 95:969-974.

Wang, Y. Q., S. B. Puntenney, and N. E. Forsberg. 2004.
Identification of the mechanisms by which OmniGen-AF, a nutritional supplement, augments immune function in ruminant livestock. Pages 349-352 in Proc. Western Section, Am. Soc. Anim. Sci. Corvallis.

Takiya, C. S., J. L. McGill, L. K. Mamedova, A. L. A. Scanavez, L. G. D. Mendonça, M. Garcia, D. E. Nuzback, and B. J. Bradford. 2020.
Effects of an immunomodulatory feed additive on granulocyte activity in peripheral blood and uterus of early lactating cows. J. Dairy Sci. 103(Suppl. 1):234. (Abstr.)



Immune Modulation Studies

Branson, J. A., D. J. McLean, N. E. Forsberg, S. A. Armstrong, T. H. Schell, and G. Bobe. 2014. ***OmniGen-AF supplementation inclusion rate independently promotes immune function in a rat model.*** J. Dairy Sci. 89(Suppl. 1):272. (Abstr.)

Burdick, N. C., J. A. Carroll, J. D. Chapman, T. H. Welsh, Jr., R. C. Vann, and R. D. Randel. 2012. ***Modulation of the metabolic response to an endotoxin challenge in Brahman heifers through OmniGen-AF supplementation.*** J. Anim. Sci. 90(E-Suppl. 3):319. (Abstr.)

Eubanks, V. J., D. J. Hurley, L. O. Ely, F. M. Kautz, S. C. Nickerson, N. E. Forsberg, Y. Q. Wang, K. P. Zanzalari, and J. D. Chapman. 2012. ***Pre- and postpartum immunomodulatory effects of a dietary supplement on the immune system of dairy heifers.*** J. Dairy Sci. 95(Suppl. 1):222. (Abstr.)

Forsberg, N.E. 2004. ***Recent insights into ruminant immune function: Effects of stress and immunostimulatory nutritional products.*** Page 81-92 in Florida Ruminant Nutrition Symp., Proc. 15th Annual Meeting. Univ. Florida, Gainesville, FL.

Forsberg, N., S. Puntenney, Y. Wang, and J. Burton. 2006. ***Nutritional modulation of innate immunity: Practical approaches.*** J. Dairy Sci. 89(Suppl. 1):272. (Abstr.)

Garcia, M., H. A. Roberts, S. A. Armstrong, J. D. Chapman, and D. J. McLean. 2020. ***OmniGen-AF and OmniGen Pro improve immunocompetence of ewes subjected to dexamethasone-induced immunosuppression.*** J. Dairy Sci. 103(Suppl. 1):176-177. (Abstr.)

Hurley, D. J., M. Adkins, C. Barber, N. A. Norton, S. C. Nickerson, L. O. Ely, F. M. Kautz, D. J. McLean, J. D. Chapman, and A. D. Rowson. 2016. ***Cell-mediated immune response to MLV BRD vaccination in Holstein heifers fed an immunomodulatory supplement.*** 97th Annual Meeting, Conference of Research Workers in Animal Diseases. Chicago.

Hurley, D. J., C. E. Barber, M. Adkins, A. D. Rowson, N. A. Norton, S. C. Nickerson, L. O. Ely, F. M. Kautz, D. J. McLean, and J. D. Chapman. 2019. ***An immunomodulatory feed additive enhances in vitro viral vaccine recall antigen responses in dairy heifers.*** Res. Vet. Sci. 127:11-17.

Mezzetti, M., A. Minuti, F. Piccioli-Cappelli, G. Gabai, and E. Trevisi. 2019. **Administration of an immune stimulant during the transition period improved lipid metabolism and rumination without affecting inflammatory status.** *Animals*. 9:619.

Nace, E. L., S. C. Nickerson, F. M. Kautz, S. Breidling, D. Wochele, L. O. Ely, and D. J. Hurley. 2014. **Modulation of innate immune function and phenotype in bred dairy heifers during the periparturient period induced by feeding an immunostimulant 60 days prior to delivery.** *Vet. Immunol. Immunopathol.* 161:240-250.

Nightingale, C. R., M. D. Sellers, A. R. Pepper-Yowell, J. D. Chapman, D. L. O'Connor, and M. A. Ballou. 2013. **OmniGen-AF supplementation improves leukocyte responses and hematology of multiparous peripartum cows.** *J. Dairy Sci.* 96(E-Suppl. 1):57. (Abstr.)

Ryman, V. E., S. C. Nickerson, F. M. Kautz, D. J. Hurley, L. O. Ely, Y. Q. Wang, and N. E. Forsberg. 2013. **Effects of dietary supplementation on the antimicrobial activity of blood leukocytes isolated from Holstein heifers.** *Res. Vet. Sci.* 95:969-974.

Wang, Y. Q., S. B. Puntener, J. L. Burton, and N. E. Forsberg. 2007. **Ability of a commercial feed additive to modulate expression of innate immunity in sheep immunosuppressed with dexamethasone.** *Animal*. 1:945-951.

Wu, Z., G. Alugongo, J. Xiao, J. Li, Y. Yu, Y. Li, Y. Wang, S. Li, and Z. Cao. 2017. **Effects of an immunomodulatory feed additive on health, blood metabolites, milk composition, and milk quality in multiparous transition Holstein cows.** *J. Dairy Sci.* 100(Suppl. 2):326. (Abstr.)

Wu, Z. H., Y. Yu, G. M. Alugongo, J. X. Xiao, J. H. Li, Y. X. Li, Y. J. Wang, S. L. Li, and Z. J. Cao. 2017. **Short communication: Effects of an immunomodulatory feed additive on phagocytic capacity of neutrophils and relative gene expression in circulating white blood cells of transition Holstein cows.** *J. Dairy Sci.* 100:7549-7555.

Challenge Studies

Armstrong, S., M. Coehlo, S. Bascom, E. Sharman, M. Garcia, D. McLean, and J. Chapman. 2019. ***OmniGen-AF alters metabolic profile and blood cell populations after 28 days of supplementation in LPS-challenged heifers.*** J. Dairy Sci. 102(Suppl. 1):180. (Abstr.)

Armstrong, S., M. Coehlo, S. Bascom, E. Sharman, D. McLean, and J. Chapman. 2019. ***OmniGen-AF alters metabolic profile and blood cell populations in beef heifers subjected to repeated LPS challenges.*** J. Anim. Sci. 97(E-Suppl. 3):210. (Abstr.)

Burdick, N. C., J. A. Carroll, J. D. Chapman, T. H. Welsh, Jr., R. C. Vann, and R. D. Randel. 2012. ***OmniGen-AF supplementation modulates the physiological and acute phase response in Brahman heifers to an endotoxin challenge.*** J. Anim. Sci. 90(E-Suppl. 3):221. (Abstr.)

Burdick, N. C., J. A. Carroll, J. D. Chapman, T. H. Welsh, R. C. Vann, and R. D. Randel. 2012. ***Modulation of the metabolic response to an endotoxin challenge in Brahman heifers through OmniGen-AF supplementation.*** J. Anim. Sci. 90(E-Suppl. 3):319. (Abstr.)

Burdick-Sanchez, N. C., J. O. Buntyn, J. A. Carroll, T. Wistuba, K. DeHaan, S. E. Sieren, S. J. Jones, and T. B. Schmidt. 2014. ***Enhancement of the acute phase response to lipopolysaccharide in feedlot steers supplemented with OmniGen-AF.*** J. Anim. Sci. 92(E-Suppl. 2):37–38. (Abstr.)

Cavallini, D., L. M. E. Mammi, A. Palmonari, R. Garcia, J. D. Chapman, D. J. McLean, and A. Formigoni. 2019. ***Effects of a nutritional and handling stress challenge in Parmigiano Reggiano lactating dairy cows.*** J. Dairy Sci. 102(Suppl. 1):179. (Abstr.)

Rowson, A., E. Aalseth, Y. Young, N. E. Forsberg, and S. B. Punttenney. 2008. ***Development of mastitis in a mouse infection model from four bovine isolates: a nutrigenomics study.*** Page 300 in Proc. Am. Assoc. Bovine Pract. (AABP), 41st Annual Conference. Charlotte. Frontier Printers Inc., Stillwater, OK.

Rowson, A., S. B. Punttenney, E. Aalseth, Y. Q. Wang, and N. E. Forsberg. 2009. ***Use of OmniGen-AF to reduce mammary E. coli infection and to augment mucosal immunity in a murine model of bovine mastitis.*** J. Anim. Sci. 87(E-Suppl. 3):3. (Abstr.)

Rowson, A., Y. Q. Wang, E. Aalseth, N. E. Forsberg, and S. B. Puntenney. 2008. ***Ability of an immunomodulatory feed additive to reduce infection of the murine mammary gland with Streptococcus uberis, Escherichia coli and Staphylococcus aureus.*** J. Dairy Sci. 91(E-Suppl. 1):301. (Abstr.)

Rowson, A. D., Y. Q. Wang, E. Aalseth, N. E. Forsberg, and S. B. Puntenney. 2011. ***Effects of an immunomodulatory feed additive on the development of mastitis in a mouse infection model using four bovine-origin isolates.*** Animal. 5:220-229.

Rowson, A., Y. Q. Wang, S. B. Puntenney, and N. E. Forsberg. 2009. ***Effects of feeding OmniGen-AF on neutrophil-mediated killing of Arcanobacterium pyogenes.*** J. Dairy Sci. 92(E-Suppl. 1):173. (Abstr.)

Vann, R. C., N. C. Burdick, J. A. Carroll, J. D. Chapman, T. H. Welsh, Jr., and R. D. Randel. 2012. ***Ultrasound body composition traits response to an endotoxin challenge in Brahman heifers supplemented with OmniGen-AF.*** J. Dairy Sci. 95(Suppl. 3):319. (Abstr.)

Wang, Y. Q., A. Rowson, N. E. Forsberg, and S. B. Puntenney. 2009. ***Effects of OmniGen-AF on mammary mucosal responses to an Escherichia coli challenge.*** J. Dairy Sci. 92(E-Suppl. 1):201. (Abstr.)



Milk, Milk Quality and Herd Health Studies

Ballantine, H. T., J. D. Chapman, Y.Q. Wang, and N. E. Forsberg. 2007. ***Effect of feeding an immune stimulatory feed supplement during the dry period on somatic cell scores (SCS) in early lactation Holstein cows.*** J. Dairy Sci. 90(Suppl. 1):10. (Abstr.)

Bascom, S. S., J. D. Chapman, L. O. Ely, G. A. Holub, J. P. Jarrett, J. S. Lanier, D. J. Kirk, D. E. Nuzback, A. D. Rowson, and T. J. Wistuba. 2016. ***Health, milk yield and milk quality records evaluated in 787 dairy herds before and during OmniGen-AF supplementation to dry and lactating cows.*** J. Anim. Sci. 94(Suppl. 5):660. (Abstr.)

Bewley, O., T. Boyle, M. Brady, K. Brubaker, J. Chapman, T. Elliott, L. Ely, S. Fitzner, A. Holland, D. Larson, R. Shaw, and J. Ydstie. 2014. ***A six year study evaluating health, milk, milk quality in 427 dairy herds fed OmniGen-AF to dry and lactating cows.*** J. Dairy Sci. 97(E-Suppl. 1):718. (Abstr.)

Brandao, A. P., R. F. Cooke, F. N. Corra, M. B. Piccolo, R. Gennari, T. Leiva, and J. L. M. Vasconcelos. 2016. ***Physiologic, health, and production responses of dairy cows supplemented with an immunomodulatory feed ingredient during the transition period.*** J. Dairy Sci. 99:5562-5572.

Chapman, J. D., S. B. Puntteney, J. Verano, J. Heeg, Y. Q. Wang, and N. E. Forsberg. 2005. ***Effects of OmniGen-AF on milk production and on lactation persistence in a commercial dairy setting.*** J. Anim. Sci. 83(Suppl. 1):176. (Abstr.)

Garcia-Gonzalez, R., P. Bozzi, M. Corsini, A. Dekker, W. Germis, E. Hoogland, J. Chapman, and L. Ely. 2017. ***Health, milk yield and milk quality records evaluated in 76 European dairy farms before and during OmniGen-AF supplementation to dry and lactating cows.*** J. Dairy Sci. 100(Suppl. 2):312. (Abstr.)

Garcia-Gonzalez, R., J. Chapman, D. McLean, and L. Ely. 2020. ***Comparison of cow health and performance in 244 European dairy farms before and during OmniGen-AF supplementation.*** J. Dairy Sci. 103(Suppl. 1):288. (Abstr.)

Hash, K. and G. Pighetti. 2020. ***Evaluating the effectiveness of a nutritional supplement in enhancing the effectiveness of selective dry cow therapy.*** Pages 158-159 in National Mastitis Council Annual Meetings Proc. Orlando.

Holland, A. E, J. D. Chapman, and L. O. Ely. 2013. ***Milk and milk quality evaluated on a commercial dairy following an OmniGen-AF dry cow and early lactation feeding strategy.*** J. Dairy Sci. 96(E-Suppl. 1):14. (Abstr.)

Holland, A. E., F. E. Rivera, J. D. Chapman, and L. O. Ely. 2015. **Health, milk, milk components, milk quality and reproduction evaluated in Holstein cows fed OmniGen-AF from dry-off through 120 days in milk.** J. Dairy Sci. 98(Suppl. 2):452. (Abstr.)

Lyles, D. D., S. C. Nickerson, F. M. Kautz, L. O. Ely, A. D. Rowson, D. J. Hurley, J. D. Chapman, and D. J. McLean. 2017. **Feeding OmniGen-AF beginning 60 days prior to dry-off reduces mastitis, lowers SCC and increases milk yield at calving in a problem dairy herd.** Pages 165-166 in National Mastitis Council Annual Meeting Proc. St. Pete Beach.

Mammi, L., M. Fustini, E. Bonfante, A. Palmonari, G. Canestrari, and A. Formigoni. 2015. **Health, milk yield and quality of Parmigiano-Reggiano cheese evaluated in cows fed OmniGen-AF from dry-off to 150 days in milk.** J. Dairy Sci. 98(Suppl. 2):100. (Abstr.)

Mammi, L. M. E., A. Palmonari, M. Fustini, D. Cavallini, G. Canestrari, J. D. Chapman, D. J. McLean, and A. Formigoni. 2018. **Immunomodulant feed supplement to support dairy cows health and milk quality evaluated in Parmigiano Reggiano cheese production.** Anim. Feed Sci. Technol. 242:21-30.

McKay, B. J., J. F. Penry, N. Chrystal, M. Gorocica, L. O. Todeschi. 2020. **The use of OmniGen-AF in New Zealand dairy herds: an observational study.** J. Dairy Sci. 103(Suppl. 1):284. (Abstr.)

Nickerson S. C., F. M. Kautz, L. O. Ely, A. D. Rowson, D. J. Hurley, J. D. Chapman, and D. J. McLean. 2019. **Effects of an immunomodulatory feed additive on intramammary infection prevalence and somatic cell counts in a dairy herd experiencing major health issues.** Res. Vet. Sci. 124:186-190.

Nickerson, S. C., F. M. Kautz, L. O. Ely, A. D. Rowson, D. J. McLean, and J. D. Chapman. 2018. **Udder health, milk production, and longevity parameters across three OmniGen-AF feeding trials.** J. Dairy Sci. 101(E-Suppl. 2):228. (Abstr.)

Orbach, N., C. Pedrini, R. Santos, B. Alem, R. Barbosa, and G. Barreto. 2017. **OmniGen-AF improves milk yield and composition of grazing dairy cows under a semi-intensive management.** J. Dairy Sci. 100(Suppl. 2):311. (Abstr.)

Takiya, C. S., L. K. Mamedova, M. Garcia, D. E. Nuzback, and B. J. Bradford. 2020. **Effects of an immunomodulatory feed additive on performance of transition cows.** J. Dairy Sci. 103(Suppl. 1):135. (Abstr.)

Heat Stress Studies

Burdick-Sanchez, N. C., J. A. Carroll, P. R. Broadway, M. L. McBride, X. A. Ortiz, J. L. Collier, R. J. Collier, J. D. Chapman, and D. J. McLean. 2015. ***OmniGen-AF alters rectal temperature (RT) and leukocyte profiles in dairy cows exposed to heat stress (HS) following acute activation of the stress axis.*** J. Dairy Sci. 98(Suppl. 2):323. (Abstr.)

Fabris, T. F., J. Laporta, F. N. Corra, Y. M. Torres, D. J. Kirk, D. J. McLean, J. D. Chapman, and G. E. Dahl. 2017. ***Effect of nutritional immunomodulation and heat stress during the dry period on subsequent performance of cows.*** J. Dairy Sci. 100:6733–6742.

Fabris, T. F., J. Laporta, D. J. McLean, D. J. Kirk, J. D. Chapman, F. N. Correa, Y. M. Torres, and G. E. Dahl. 2016. ***Effect of OmniGen-AF and heat stress during the dry period on subsequent performance of cows.*** J. Anim. Sci. 94(Suppl. 5):346. (Abstr.)

Fabris, T. F., J. Laporta, D. J. McLean, D. J. Kirk, J. D. Chapman, F. N. Corra, Y. M. Torres, and G. E. Dahl. 2017. ***Nutritional and cooling strategies to alter mammary involution and development of heat stressed dry cows.*** J. Dairy Sci. 100(Suppl. 2):386. (Abstr.)

Fabris, T. F., J. Laporta, D. J. McLean, D. J. Kirk, J. D. Chapman, F. N. Corra, Y. M. Torres, and G. E. Dahl. 2017. ***Strategies to ameliorate the negative impact of heat stress on immune status of cows during the dry period.*** J. Dairy Sci. 100(Suppl. 2):70-71. (Abstr.)

Fabris, T. F., A. Skibieli, J. Laporta, D. J. McLean, D. J. Kirk, J. D. Chapman, and G. E. Dahl. 2018. ***Heat stress and OmniGen-AF alter mammary gland gene expression and endocrine responses in the dry period.*** J. Dairy Sci. 101(Suppl. 2):69. (Abstr.)

Gandra, J. R., C. S. Takiya, T. A. Del Valle, N. D. Orbach, I. R. Ferraz, E. R. Oliveira, R. H. T. B. Goes, E. R. S. Gandra, T. L. Pereira, J. D. O. Batista, H. M. C. Araki, J. Damiani, A. Z. Escobar. 2019. ***Influence of a feed additive containing vitamin B12 and yeast extract on milk production and body temperature of grazing dairy cows under high temperature-humidity index environment.*** Livest. Sci. 221:28-32.

Hall, L. W., S. D. Anderson, F. A. Rivera, F. Villar, J. D. Chapman, N. M. Long, and R. J. Collier. 2013. ***Evaluation of OmniGen-AF in heat stressed Holstein cows in lactation.*** J. Dairy Sci. 96(E-Suppl. 1):448. (Abstr.)

Hall, L. W., F. A. Rivera, F. Villar, J. D. Allen, J. D. Chapman, N. M. Long, and R. J. Collier. 2014. ***The effects of OmniGen-AF on serum metabolites, calcium concentrations and hormones of the adrenal axis during heat stress in lactating Holstein cows.*** J. Dairy Sci. 97(E-Suppl. 1):905. (Abstr.)

Hall, L. W., F. Villar, J. D. Chapman, D. J. McLean, N. M. Long, Y. Xiao, J. L. Collier, and R. J. Collier. 2018. ***An evaluation of an immunomodulatory feed ingredient in heat-stressed lactating Holstein cows: Effects on hormonal, physiological, and production responses.*** J. Dairy Sci. 7095-7105.

Holland, A. E., J. D. Chapman, and L. O. Ely. 2014. ***Milk production, dry matter intake and body condition score evaluated in cross-bred commercial cows supplemented with OmniGen-AF during and following heat stress.*** J. Dairy Sci. 97(E-Suppl. 1):729. (Abstr.)

Leiva, T., R. F. Cooke, A. P. Brandao, R. L. A. Cerri, R. O. Rodrigues, and J. L. M. Vasconcelos. 2016. ***Effects of OmniGen-AF supplementation on body temperature, milk production, and somatic cell count in lactating dairy cows.*** J. Anim. Sci. 94(Suppl. 5):554-555. (Abstr.)

Leiva, T., R. F. Cooke, A. P. Brandão, K. M. Schubach, L. F. D. Batista, M. F. Miranda, E. A. Colombo, R. O. Rodrigues, J. R. G. Junior, R. L. A. Cerri, and J. L. M. Vasconcelos. 2017. ***Supplementing an immunomodulatory feed ingredient to modulate thermoregulation, physiologic, and production responses in lactating dairy cows under heat stress conditions.*** J. Dairy Sci. 100:4829–4838.

McBride, M. L., N. C. Burdick-Sanchez, J. A. Carroll, P. R. Broadway, X. A. Ortiz, J. L. Collier, J. D. Chapman, D. J. McLean, H. Kattesh, and R. J. Collier. 2016. ***OmniGen-AF reduces basal plasma cortisol as well as cortisol release to adrenocorticotrophic hormone or corticotrophin releasing hormone and vasopressin in lactating dairy cows under thermoneutral or acute heat stress conditions.*** J. Anim. Sci. 94(Suppl. 5):541-542. (Abstr.)

Marins, T. N., J. Gao, Q. Yang, R. M. Binda, C. M. B. Pessoa, R. M. Orellana Rivas, J. K. Bernard, M. Garcia, D. J. McLean, J. D. Chapman, D. J. Kirk, and S. Tao. 2020. ***Impact of heat stress and OmniGen-AF on performance and immunity of mid-lactation dairy cows.*** J. Dairy Sci. 103(Suppl. 1):105. (Abstr.)

Heat Stress Studies



Marins, T. N., J. Gao, Q. Yang, R. M. Binda, C. M. B. Pessoa, R. M. Orellana Rivas, J. K. Bernard, M. Garcia, D. J. McLean, J. D. Chapman, D. J. Kirk, and S. Tao. 2020. ***Effects of heat stress and OmniGen-AF on physiological and inflammatory responses of mid-lactation dairy cows to intravenous lipopolysaccharide infusion.*** J. Dairy Sci. 103(Suppl. 1):283-284. (Abstr.)

McBride, M. L., N. C. Burdick-Sanchez, J. A. Carroll, P. R. Broadway, X. A. Ortiz, J. L. Collier, J. D. Chapman, D. J. McLean, H. G. Kattesh, B. E. Gillespie, Y. Xiao, and R. J. Collier. 2020.

Response to adrenocorticotrophic hormone or corticotrophin-releasing hormone and vasopressin in lactating cows fed an immunomodulatory supplement under thermoneutral or acute heat stress conditions. J. Dairy Sci. 103:6612-6626.

Skibieli, A. L., T. F. Fabris, F. N. Corrá, Y. M. Torres, D. J. McLean, J. D. Chapman, D. J. Kirk, G. E. Dahl, and J. Laporta. 2017. ***Effects of feeding an immunomodulatory supplement to heat stressed or actively cooled cows during late gestation on postnatal immunity, health, and growth of calves.*** J. Dairy Sci. 100:7659-7668.

Skibieli, A., J. L. Powell, T. F. Fabis, Y. M. Torres, F. N. Corra, J. D. Chapman, D. J. McLean, D. J. Kirk, G. E. Dahl, and J. Laporta. 2016. ***Effects of OmniGen-AF supplementation to heat stressed cows during late gestation on blood parameters and immune cells of their calves.*** J. Anim. Sci. 94(Suppl. 5):564. (Abstr.)

Reproduction Studies

Casarotto L. T., K. Ferreira, B. D. Davidson, K. Moy, A. K. Almeida, J. Laporta, J. D. Chapman, D. J. McLean, D. J. Kirk, and G. E. Dahl. 2019. **Effect of OmniGen-AF feeding during the dry period and early lactation on performance and health in cows.** J. Dairy Sci. 102(Suppl. 1):57. (Abstr.)

Casarotto, L. T., V. Ouellet, J. Laporta, J. D. Chapman, A. De Vries, and G. E. Dahl. 2020. **Economic impacts of feeding an immune modulator to multiparous dry Holstein dairy cows.** J. Dairy Sci. 103(Suppl. 1):40. (Abstr.)

Casarotto, L. T., J. Laporta, K. Ferreira, B. D. Davidson, K. Moy, A. K. Almeida, J. D. Chapman, D. J. McLean, D. J. Kirk, N. I. Barbu, V. Ouellet, and G. E. Dahl. 2020. **Effect of feeding an immune modulator to multiparous Holstein cows during the dry period and early lactation on health, milk and reproductive performance.** Anim. Feed. Sci. Technol. 267:1-9.

Jorgensen-Muga, K., D. McLean, J. Pru, and C. Pru. 2018. **Effect of OmniGen- AF supplementation on uterine involution and fertility in a murine model of endometritis.** J. Anim. Sci. 96(E-Suppl. 3):51. (Abstr.)



Snider, A. P., S. A. Armstrong, D. J. McLean, and A. R. Menino Jr. 2017. **Effects of OmniGen-AF supplementation on in vitro embryo development and gene expression in superovulated donor beef cows.** J. Anim. Sci. 95(Suppl 4):53. (Abstr.)

Snider, A. P., M. R. Gellings, S. A. Armstrong, D. J. McLean, and A. R. Menino, Jr. 2016. **Effects of OmniGen-AF on superovulation response and embryo quality in donor beef cows.** J. Dairy Sci. 99(E-Suppl. 1):531. (Abstr.)

Snider, A. P., D. McLean, and A. R. Menino Jr. 2019. **Effects of feeding OmniGen-AF on superovulatory response in donor beef cows: I. Serum progesterone and cortisol, embryo recovery and quality.** Anim. Reprod. Sci. 210:1-9.

Calf & Heifer Studies



Bewley, O., J. D. Chapman, Y. Q. Wang, and N. E. Forsberg. 2011. **Effects of OmniGen-AF on performance and economics of a veal operation.** J. Dairy Sci. 94(E-Suppl. 1):620. (Abstr.)

Holland, A. E., J. D. Chapman, L. O. Ely, and Y. Q. Wang. 2013. **Growth and health costs used to evaluate OmniGen-AF feeding strategies in Jersey heifer calves reared on a commercial dairy.** J. Dairy Sci. 96(E-Suppl. 1):57. (Abstr.)

Leme, B. B., L. F. Barbosa, I. C. Marabiza, A. C. Mariano, S. H. Casonato, and J. L. M. Vasconcelos. 2017. **OmniGen-AF supplementation during the first 150 days of life decreases the incidence of tick fever in dairy calves.** J. Dairy Sci. 100(Suppl. 2):41. (Abstr.)

Liang, Y., R. E. Hudson, T. L. Harris, K. P. Sharon, J. P. Jarrett, D. J. McLean, J. D. Chapman, J. A. Carroll, and M. A. Ballou. 2016. **Effects of OmniGen-AF and Provia 6086 on growth, leukocyte, and hematological variables of pre-weaned and immediately postweaned Holstein calves.** J. Anim. Sci. 94(Suppl. 5):50-51. (Abstr.)

Rowson, A. D., T. H. Schell, Y. Wang, N. E. Forsberg, and S. B. Puntenney. 2012. **Dietary adjuvanting prior to vaccine administration increases maternal antibody transfer to calves.** J. Dairy Sci. 95(E-Suppl. 2):397. (Abstr.)

Beef Cattle Studies

Armstrong, S. A., D. J. McLean, M. Bionaz, and G. Bobe. 2017. ***OmniGen-AF supplementation may attenuate liver damage during a high concentrate diet in finishing steers.*** J. Anim. Sci. 95(Suppl 4):17-18. (Abstr.)

Armstrong, S. A., D. J. McLean, and G. Bobe. 2018. ***The effect of a commercial feed additive on the immune-metabolic axis, liver function and predicted carcass quality in purebred Angus steers.*** Livest. Sci. 210:39-46.

Armstrong, S. A., D. J. McLean, G. Bobe, M. Bionaz, and T.J. Wistuba. 2016. ***Effects of OmniGen-AF dietary supplementation on ultrasound parameters in purebred Angus steers fed a finishing diet.*** J. Anim. Sci. 94(Suppl. 5):113 (Abstr.)

Burdick-Sanchez, N.C., J. A. Carroll, P. R. Broadway, T. H. Schell, S. B. Puntenney, and D. J. McLean. 2017. ***Supplementation of OmniGen-AF alters the metabolic response to a glucose tolerance test in beef heifers.*** J. Anim. Sci. 95(Suppl 4):215-216. (Abstr.)

Burdick Sanchez, N. C., J. A. Carroll, P. R. Broadway, T. H. Schell, S. B. Puntenney, and D. J. McLean. 2019. ***Supplementation of OmniGen-AF improves the metabolic response to a glucose tolerance test in beef heifers.*** Transl. Anim. Sci. 3:1521-1529.

Colombo, E. A., R. F. Cooke, A. A. Millican, K. M. Schubach, G.N. Scatolin, B. Rett, and A. P. Brandao. 2019. ***Supplementing an immunomodulatory feed ingredient to improve thermoregulation and performance of finishing beef cattle under heat stress conditions.*** J. Anim. Sci. 97:4085-4092.

Crook, T. S., J. E. Koltz, B. Stewart, C. Shelton, M. B. Sims, D. J. McLean, J. D. Chapman, and P. A. Beck. 2017. ***Effect of OmniGen-AF on the pre-weaning performance of beef calves.*** J. Anim. Sci. 95(Suppl. 4):42. (Abstr.)

Lippolis, K. D., R. F. Cooke, T. Schumacher, A. P. Brandao, L. G. T. Silva, K. M. Schubach, R. S. Marques, and D. W. Bohnert. 2017. ***Physiologic, health, and performance responses of beef steers supplemented with an immunomodulatory feed ingredient during feedlot receiving.*** J. Anim. Sci. 95:4945-4957.

Schell, T. H., J. Branson, S. Armstrong, M. Lewis, A. Snider, D. McLean, and G. Bobe. 2016. ***Effect of OmniGen-AF supplementation on the metabolic profile of growing beef cattle.*** J. Anim. Sci. 94(Suppl. 5):114. (Abstr.)

Small Ruminants Studies



Rowson, A., S. Armstrong, T. Boyle, S. Puntenney, L. Ely, and D. McLean. 2016. ***Milk production, somatic cell count, percentages milk fat and milk protein measured in lactating dairy goats fed a nutritional supplement.*** JVSAH. 4:1-7.

Rowson, A. D., S. A. Armstrong, L. O. Ely, and D. J. McLean. 2015. ***Milk production, quality and components measured in lactating dairy goats supplemented with OmniGen-AF.*** J. Dairy Sci. 98(E-Suppl. 2):171. (Abstr.)

Rowson, A. D., T. J. Boyle, D. J. McLean, S. A. Armstrong, and S. B. Puntenney. 2014. ***Milk quality and milk components in lactating dairy goats fed OmniGen-AF from dry-off through the entire lactation.*** J. Dairy Sci. 97(E-Suppl. 1):46. (Abstr.)

Rowson, A. D., T. J. Boyle, D. J. McLean, S. A. Armstrong, and S.B. Puntenney. 2014. ***The effects of OmniGen-AF on milk quality and milk components over an entire lactation in dairy goats.*** Page 180 in Proc. Am. Assoc. Bovine Pract. (AABP), 47th Annual Conference. Albuquerque. VM Publishing Comp., Stillwater, OK.



Other Studies

Huzzey, J. M., D. J. McLean, S. A. Armstrong, and J. P. Jarrett. 2018. **Effects of feeding OmniGen-AF on energy metabolism, fecal cortisol metabolites, and markers of immunity in overcrowded lactating Holstein dairy cows.** J. Dairy Sci. 101(Suppl. 2):283. (Abstr.)

Jiang, Y., M. Garcia, M. L. A. Roberts, G. A. Blakeney, J. D. Chapman, and D. J. McLean. 2020. **Effects of OmniGen Pro on performance, digestibility, and rumen fermentation of Holstein heifers.** J. Dairy Sci. 103(Suppl. 1):258. (Abstr.)

Jiang, Y., M. Garcia, H. L. A. Roberts, G. A. Blakeney, J. D. Chapman, and D. J. McLean. 2020. **Effects of OmniGen Pro on performance and rumen fermentation of Jersey heifers.** J. Dairy Sci. 103(Suppl. 1):258. (Abstr.)

Ou, B. R., A. Rowson, S. Puntenney, and N. E. Forsberg. 2011. **Array analysis of mucosal gene expression in the intestine of rats following ingestion of OmniGen-AF.** J. Anim. Sci. 89(E-Suppl. 2):53. (Abstr.)

Playford, M. C., K. Dawson, S. E. Playford, A. N. Smith, S. W. Page, K. Collins, and N. Forsberg. 2014. **Effect of an immunomodulatory feed additive on markers of immunity in pasture-fed dairy cows.** Aust. Vet. J. 92:479-81.

Puntenney, S. B., Y. Wang, A. Rowson, and N. E. Forsberg. 2010. **Effects of OmniGen-AF on the development of humoral immune responses in beef cattle and in rats following a vaccination program.** J. Dairy Sci. 93(E-Suppl. 1):764. (Abstr.)

Takiya, C. S., L. K. Mamedova, L. Sordillo, J. Gandy, M. Garcia, E. E. Gultepe, D. E. Nuzback, and B. J. Bradford. 2020. **Effects of an immunomodulatory feed additive on biomarkers of inflammation and oxylipid profile in blood of transition cows.** J. Dairy Sci. 103(Suppl. 1):234. (Abstr.)

Wada, K., H. Endo, J. Takahashi, H. Yano, E. Watanabe, M. Koya, S. Abe, T. Katoh, and Y. Ogata. 2008. **Influence of Aspergillus fumigatus in feeds and effect of the yeast cell wall-mixed additive on dairy herd.** Jpn. Soc. Clin. Infect. Dis. 3:13-16.

Wang, Y. Q., S. B. Puntenney, J. L. Burton, and N. E. Forsberg. 2009. **Use of gene profiling to evaluate the effects of a feed additive on immune function in periparturient dairy cattle.** J. Anim. Physiol. Anim. Nutr. 93:66-75.

Wu, Z., G. M. Alugongo, J. Xiao, J. Li, Y. Yu, Y. Li, Y. Wang, S. Li, and Z. Cao. 2019. **Effects of an immunomodulatory feed additive on body weight, production parameters, blood metabolites, and health in multiparous transition Holstein cows.** J. Anim. Sci. 90:167-177.



800.677.4623

TheOmniGenDifference.com

Some citations included here do not represent the entire study.
Please contact your Phibro Dairy Technology Manager for full details.

OG100420GLB ©2020 Phibro Animal Health Corporation
Phibro, Phibro logo design, Healthy Animals. Healthy Food. Healthy World.,
and OmniGen are trademarks owned by or licensed to Phibro Animal Health
Corporation or its affiliates.

