



Modulating the Immune Response Improves Reproductive Performance of Dairy Cows

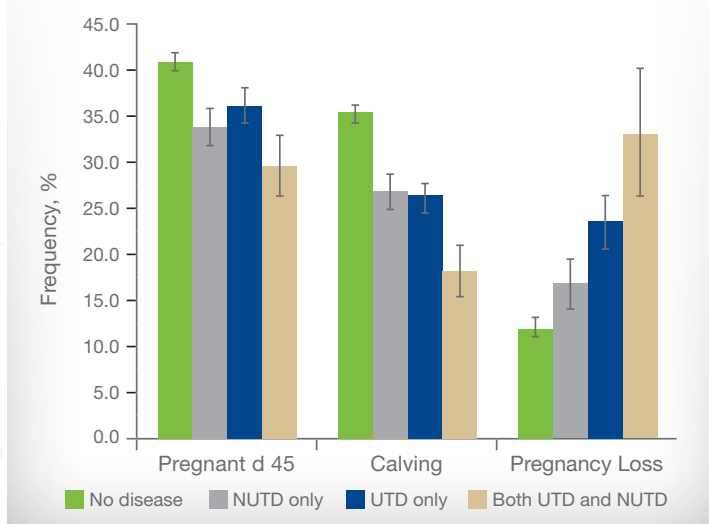
Immune function affects reproduction of dairy cows, both directly by helpful actions of immune cells in the reproductive system, and indirectly by negative effects of diseases (Rowson and Kirk, 2015). Recent research has expanded our understanding of the impacts of fresh cow diseases on reproduction in dairy cows, and how these diseases work to affect reproductive performance. Feeding OmniGen® nutritional specialty product helps improve immune function. Cows with improved immune function have been shown to have improved conception rates and reduced number of days open.

Effects of Disease on Reproduction

In a study reported by researchers from the University of Florida, fresh cow diseases reduced the percentage of cows bred, lowered conception rates and reduced the percentage of cows that delivered a calf after the next pregnancy (Carvalho et al., 2019). Their results indicate that the detrimental consequences of early-postpartum disease extend for months after resolution of clinical symptoms. An earlier report from the University of Florida showed reduced conception rate at 45 days after artificial insemination (AI) service and pregnancy loss was increased in cows with at least one inflammatory disease from calving until pregnancy diagnosis following the first artificial insemination (Ribeiro et al., 2016). Although inflammation is a normal part of a healthy immune response, if it is excessive or prolonged, it can have negative results, including tissue damage and inefficient energy expenditure. The researchers indicated these diseases may result in chronic inflammation which can lead to long-term effects on reproduction, related to damage to the uterine environment or the developing follicles.

The carryover effects of disease could not be explained by estrous cyclicity at the onset of breeding, or the cows' nutritional status and the consequences on body condition score.

Figure 1. Pregnancy per Breeding at 45 d After Breeding, Calving per Breeding, and Pregnancy Loss Through Calving by Incidence of Uterine (UTD) and Non-uterine (NUTD) Disease



Ribeiro et al., 2016.

Effects of OmniGen on Reproduction

Recent studies have demonstrated that feeding OmniGen improves the immune function, which may lead to improved reproductive performance.

Adult female mice were fed a basal diet with or without OmniGen (Jorgensen-Muga et al., 2017). Feeding OmniGen resulted in an average of five more pups per litter during the first two litters, and larger litter size over the course of the six-month study. There was also a trend toward decreased time to first parturition of approximately seven days. Mice fed OmniGen tended to have fewer ($P < 0.10$) fibrotic lesions and had more ($P < 0.05$) blood vessels in the endometrium than mice fed the control diet, suggesting animals fed OmniGen were more resistant to tissue damage and/or recovered more effectively.

Researchers at Oregon State University determined Angus cross-bred embryo donor cows fed OmniGen had fewer degenerate embryos (fertilized ovum that have died) recovered and the percent degenerate embryos was lower compared to control-fed cows (Snider et al., 2019).



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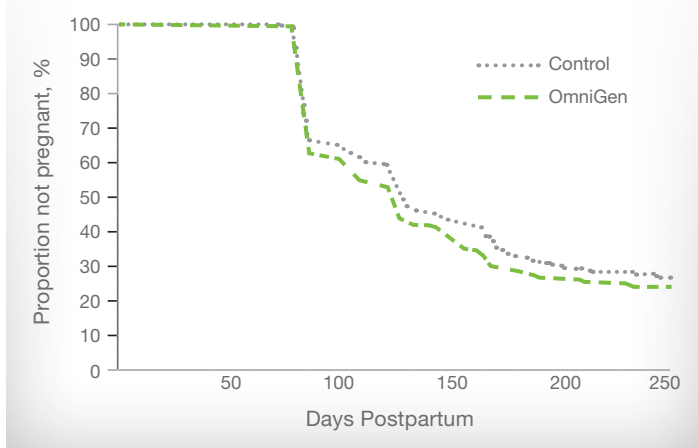
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The results suggest that feeding OmniGen for improved immunity may lead to improved quality of the oocyte or the embryo. Similar benefits may occur when OmniGen is fed to conventionally bred cows; improved immunity may lead to improved embryo survival.

The preceding research showing OmniGen helped improve the uterine environment in mice and improved embryo quality in beef cattle, led to a large herd study to examine the effects of feeding OmniGen on reproduction in dairy cows (Casarotto et al., 2020). Multiparous Holsteins were fed 56 g OmniGen or AB20® (sodium calcium aluminosilicate Control) from dry-off through approximately 150 DIM. Cows produced 1.6 lb more milk per day when fed OmniGen. In addition, incidence rates of mastitis and retained placenta tended to be less, and days in the hospital pen was reduced for cows fed OmniGen in the study.

The pregnancy survival curve in Figure 2 indicates the percentage of cows that were not pregnant during the 230 days after calving. The graph reflects an improvement in the percentage of cows confirmed pregnant after first artificial insemination (32.6% compared to 28.1%, respectively, $P > 0.10$), leading to a lower percentage of cows not pregnant when fed OmniGen, through the end of the trial. Cows fed OmniGen had a 10-day reduction ($P < 0.05$) in days open compared to feeding the control diet (139 vs. 149 ± 3.44 d, respectively), indicating improved reproductive efficiency in these cows.

Figure 2. Proportion of Cows Not Pregnant When Fed With or Without OmniGen



Casarotto et al., 2020.

Summary

The immune system can affect reproduction in dairy cattle due to direct effects of immune cells on reproductive tissues and/or by impacts of inflammation. Recent research indicates inflammatory diseases have long-lasting negative effects on reproduction related to damaged uterine environment and/or developing follicles of cows. Feeding OmniGen to support immune modulation may lead to improved reproductive performance of dairy cows. Controlled research has demonstrated that feeding OmniGen for immune support can lead to an improved uterine environment in mice and improved embryo quality in beef cows, and research conducted by the University of Florida showed feeding OmniGen for immune support improved reproductive performance in dairy cows, with 10 fewer days open than cows fed without OmniGen.

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This information has been prepared for industry technical professionals.