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**Immune Response and Milk Production Compete for Resources**  
**Metabolic demands of the immune response to mastitis reduce glucose and amino acids available to support milk production, according to a review in *Applied Animal Science***

Philadelphia, PA, July 22, 2019 Monetary losses from mastitis result from several factors: reduced milk production and quality; increased labor, veterinary costs, and drug use; discard of abnormal and antibiotic-laden milk; and, premature culling of affected animals. Among these, the greatest contributing factor is the reduced milk production of affected animals. The answers to the question of why milk yield reduction occurs during mastitis are many and interrelated.

Milk production is solely a function of the number of cells in the udder that synthesize and secrete milk and the average rate at which these cells synthesize and secrete milk components. Cellular and tissue damage that occurs during a mastitis event are associated with milk yield reductions. Although these consequences are undeniably significant contributing factors, milk yield losses during mastitis are also suspected to be consequence of reductions in substrate availability and, consequently, reductions in cell synthesis and secretory activity.

“It can be recognized that there are certain energy requirements for an activated immune response. In the instance of mastitis, the activated immune cells that are recruited to the mammary gland are in the same locale as the cells that produce milk,” said author Benjamin D. Enger of The Ohio State University. “Such localization is expected to redirect some of the glucose and amino acids that would otherwise be used to support milk synthesis to the activated local immune cells requiring substrates for cellular functions.”

*Applied Animal Science* Editor-in-Chief David K. Beede said, “Mastitis with loss of milk yield and quality remains the most common and expensive disease in modern dairy production. This invited review addresses the prospect that substrate demands of activated localized immune cells might be a contributing factor by reducing glucose and amino acids available for milk synthesis. Future research should address this possibility.”

“The competition for glucose and amino acids would indicate that some nutrients being fed to the cow to support milk production may be used instead to address a preventable disease,” Enger added. “The importance of limiting the incidence and prevalence of mastitis on the farm is stressed given that such

competitive nutrient utilization is expected to negate any intended improvements in milk yield that are nutritionally driven.”

The review appears in the August issue of *Applied Animal Science*.

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#### **NOTES FOR EDITORS**

“INVITED REVIEW: Reevaluating how mastitis reduces milk yield: Discussion of competitive substrate utilization,” by Benjamin D. Enger (DOI: <https://doi.org/10.15232/aas.2019-01876>), *Applied Animal Science*, Volume 35, Issue 4 (August 2019), published by FASS Inc. and Elsevier Inc.

Full text of the article is available to credentialed journalists upon request; contact Brittany Morstatter at +1 217 356 3182 ext 143 or [arpas@assoqhq.org](mailto:arpas@assoqhq.org) to obtain copies. To schedule an interview with the authors, please contact Benjamin D. Enger at +1 330 263 3801 or [enger.5@osu.edu](mailto:enger.5@osu.edu).

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