The Growth and Development Symposium titled “Understanding and mitigating the impacts of inflammation on animal growth and development” was held at the Joint Annual Meeting of the American Society of Animal Science and the American Dairy Science Association in New Orleans, LA, July 10 to 14, 2011. The goals of the symposium were to highlight advances in the study of the complex processes of inflammation as it relates to growth and development of agricultural species, and to identify potential targets amenable to mitigation and prevention of production losses due to chronic inflammation. Under normal physiological circumstances, inflammation serves to protect tissues from infection, irritation, or injury, which is critical to maintaining homeostasis and support animal survival. However, sustained stimulation of the inflammatory response impairs normal growth and development, and limits productivity by preventing an animal from attaining its full genetic potential. For instance, direct interactions between pro-inflammatory molecules with myofibers, adipocytes, and mammary and intestinal epithelial cells recently have been described that result in modifications of their metabolic and anabolic functions. Modified anabolic responses of these cells can reduce production efficiency, leading to significant economic losses in animal production agriculture. A more thorough understanding of the complex interactions of the immune system with productive tissues can assist in the development of means to reduce and prevent these economic losses due to chronic inflammation. The symposium provided a general overview of inflammation and the effects of anti-inflammatory compounds on animal growth and health, followed by more specific discussions of the effects of inflammation on growth of beef cattle and carcass merit, intestinal function as it relates to growth in swine, production losses of dairy cattle during mastitis, and overall efficiency of nutrient use in production animals.

Inflammation is a normal and necessary response to infection and tissue injury. However, prolonged or excessive inflammation can impair growth and development, as well as limit animal productivity. The first speaker of the symposium, Theo Niewold (Universiteit Leuven, Heverlee, Belgium), discussed mechanisms inducing the negative impacts of inflammation on animal growth and potential action of antimicrobial growth promoters as direct inhibitors of intestinal inflammation (Niewold, 2011). Use and effectiveness of anti-inflammatory compounds and anti-inflammatory feeds were identified as future areas of investigation.

As the second speaker of the symposium, Clint Krehbiel (Oklahoma State University, Stillwater) discussed the economic impacts of bovine respiratory disease (BRD) on growth performance and carcass characteristics of feedlot cattle (Gifford et al., 2012). In addition, the physiological mechanisms involved in the immune response that may contribute to these negative effects on production were highlighted. For example, BRD is the primary cause of cattle death in U.S. feedlots, costing an average of $12.60/animal for treatment (USDA-APHIS, 2001). Production losses associated with BRD result from reduced DMI, which negatively impacts ADG and G:F, and may have long-term negative consequences, such as poor carcass quality (e.g., reduced marbling and LM area) and reduced retail yield. The authors suggest that factors associated with...