Liver Abscess Special Issue: *Applied Animal Science* Synthesizes Researchers’ and the Cattle Industry’s Knowledge, Resources, and Progress Tackling a Costly Disease

This review outlines the key points and takeaways of each article in the Special Issue offering a helpful guide to all stakeholders tackling liver abscesses in the cattle industry.

Champaign, IL, July 8, 2024—*Applied Animal Science*, the official journal of the American Registry of Professional Animal Scientists (ARPAS), has released a Special Issue dedicated to liver abscesses in cattle. A growing concern in recent years, the disease has significant effects on the efficiency and sustainability of cattle production and has proved difficult to study, prevent, and mitigate. Included in the issue is a helpful synthesis of learnings and next steps for beef researchers and the industry as a whole. “This review summarizes the 17 contributions in this Special Issue about Liver Abscesses in Cattle,” explained David K. Beede, PhD, Editor in Chief of the journal, “and emphasizes possible basic and applied research that should be undertaken to better understand the pathogenesis of abscesses and to resolve this costly disease in feedlot cattle.”

Kristin Hales, PhD, the President of ARPAS and Associate Editor of *Applied Animal Science*, authored the review and explained the genesis of the Special Issue. “Our impetus to develop this Special Issue started with the ARPAS Symposium on Liver Abscesses in Cattle hosted in July 2023. We realized that the industry would benefit from a single resource on the topic, and—since the journal strives to bridge the gap between research innovation and useful applications in the field—we knew *Applied Animal Science* would be an ideal platform to get the learnings into the hands of the full spectrum of stakeholders in animal agriculture.”

The review lays out the key points and takeaways of each of the 17 articles in the issue ranging from practical dietary intervention strategies to experiments designed to understand the mode of action and the etiology of liver abscess development, including the following:
Liver abscesses affect cattle well-being and cost the cattle industry $400 million annually. The new Special Issue in *Applied Animal Science* collects the latest research on the topic in one place and gives direction for future investigation (Credit: Kristin Hales).

- New perspectives on a historic fed-cattle problem, including that liver abscesses are a multifactorial, polymicrobial disease that affects productivity and profitability in all stages of the beef production continuum;
- Detection and quantification of the microbes understood to play a role in abscess formation, including *Fusobacterium necrophorum* and *Fusobacterium varium*;
- Dietary, supplementation, and management strategies to mitigate liver abscess prevalence;
- Historical data of the effects of liver abscesses on carcass characteristics and value;
- Blood-based biomarkers for the detection of liver abscesses; and
- A novel model tool that can be used to experimentally induce liver abscesses in steers.

Based on the research presented in this Special Issue, Hales also outlined themes to help guide future liver abscess research including the following:

- Exploring pathogens associated with liver abscess development, specifically *Salmonella* and *Fusobacterium varium*;
- Understanding how ruminal acidosis is associated with development of liver abscesses;
- Determining the relationship among rumenitis, *Fusobacterium varium*, and liver abscess development;
- Developing effective mitigation or management strategies to prevent liver abscess in finishing cattle;
Identifying accurate and specific physiological indicators or biomarkers of liver abscess in live cattle and using biomarkers to determine the time frame for liver abscess formation and ability to resolve while cattle are on feed;

Exploring and elucidating the involvement of the small and large intestine and gut barrier dysfunction in liver abscess formation;

Better understanding the differentially expressed genes in cattle with and without liver abscesses to determine the influence of genetics on this disease;

Determining how cattle breed types affect liver abscess prevalence; and

Identifying how early life calf management affects the prevalence of liver abscess at slaughter.

“We are thrilled with the final collection of articles and know that they offer a rich resource for the cattle industry and actionable guidance to professionals in the field and help guide the basic and applied research needed to keep advancing our knowledge of this disease,” said Hales.

The review appears in the June issue of Applied Animal Science.

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Notes for editors

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To schedule an interview with the author, please contact Kristin Hales, PhD, at kristin.hales@ttu.edu.

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