



# SARFORD'S NEWS

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## POSTER ON METHANE REDUCTION TAKES TOP HONORS AT NEBRASKA SYMPOSIUM IN INTERDISCIPLINARY GRADUATE RESEARCH (NEINSCI)

By Dr. Clayton McNeff

The conclusion of a recent poster presented at a symposium in interdisciplinary graduate research at the University of Lincoln-Nebraska contains some exciting news for SarTec's customers:

*"Yucca schidigera inhibits methanogenesis and promotes VFA synthesis in in vitro cultures of ruminal fluid."*

Eric J. Behlke is a graduate student who works for Professor Jess Miner and the Animal Science Department at the University of Lincoln Nebraska. He recently entered a poster in a university wide contest that had 85 entries from several different departments across the campus. His poster was entitled, "Effect of *Yucca schidigera* extract on CH<sub>4</sub> and VFA Production in Cultures Inoculated with Rumen Fluid." It was chosen as one of the top three posters of the entire symposium.

As we noted in a previous SarFord News article, Methane production in the rumen of cattle ("methanogenesis") is a nutritionally wasteful process that is implicated in global warm-

ing (1). Methane production in the rumen results in a costly loss of 3-12% of gross feed energy. This energy loss translates to a total cost of about 0.4-1.5 billion dollars a year at today's ration prices for dairy and beef producers in feed cost alone.

Figure 1 shows how methane is produced in the rumen of cattle. The carbohydrates in the feed are broken down by rumen bacteria to produce pyruvate, lactate and VFAs. Methanogens use hydrogen that is produced by rumen protozoa along with carbohydrates from the feedstuff to produce methane which is then eructated out of the animal. The net result of this loss is less energy available to the animal for growth and milk production.

Global warming is a heavily debated topic that could have widespread implications for rainfall patterns, sea levels, and adverse health impacts on plants, wildlife, and humans. The potential impacts on human health include increased risk of heat stress and other heat related health problems that are caused directly by very warm temperatures and high humidity. More hot days increase the possibility of heat related health problems. Indirect effects on air pollution, changes in food and water sup-

plies, and coastal flooding are all examples of possible impacts that might affect human health. Due to the enormous long-term risk of global warming, many cities, states and governmental agencies across the United States are actively pursuing programs and policies that will result in greenhouse gas emission reductions.

One of the most potent greenhouse gases linked to global warming concerns is methane. Biological methane formation is a microbial process catalyzed by Methanogens, which are members of the *Archaea* domain, the third kingdom of life. In fact, ruminal methanogenesis produces about 80 million tons of methane/year, second to the mining, processing, and use of coal, oil, and natural gas (100 million tons).

Yucca extracts are approved for use in animal feeds as a flavoring agent as listed in the Association of American Feed Control Officials book, (IFN 8-19-700, reg 172.510).



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- Beef Up Our Troops
- Methane reduction poster wins top spot at University of Nebraska
- SarFord's Kitchen - Rosemary Grilled Flank Steak
- Employee Feature: Travis Halsted

**SARFORD'S KITCHEN**

**Rosemary Grilled Flank Steak**

**Ingredients:**

- 1 cup red wine
- 1/2 cup olive oil
- 1 t. Worcestershire sauce
- 1 T. chopped parsley
- 1 bay leaf

- 3 garlic cloves, minced
- 1 t. dried oregano
- 1 t. seasoned salt
- 1 t. pepper
- 1 pounds flank steak
- Rosemary sprigs
- 2 T. lemon juice

**Preparation:**

Combine first 10 ingredients. Reserve 1/4 cup mixture. Place flank steak in a large shallow

dish or a large heavy-duty zip-top plastic bag.

Pour red wine mixture over steak. Cover or seal and chill 2 - 4 hours, turning occasionally.

Remove flank steak from marinade, discarding marinade.

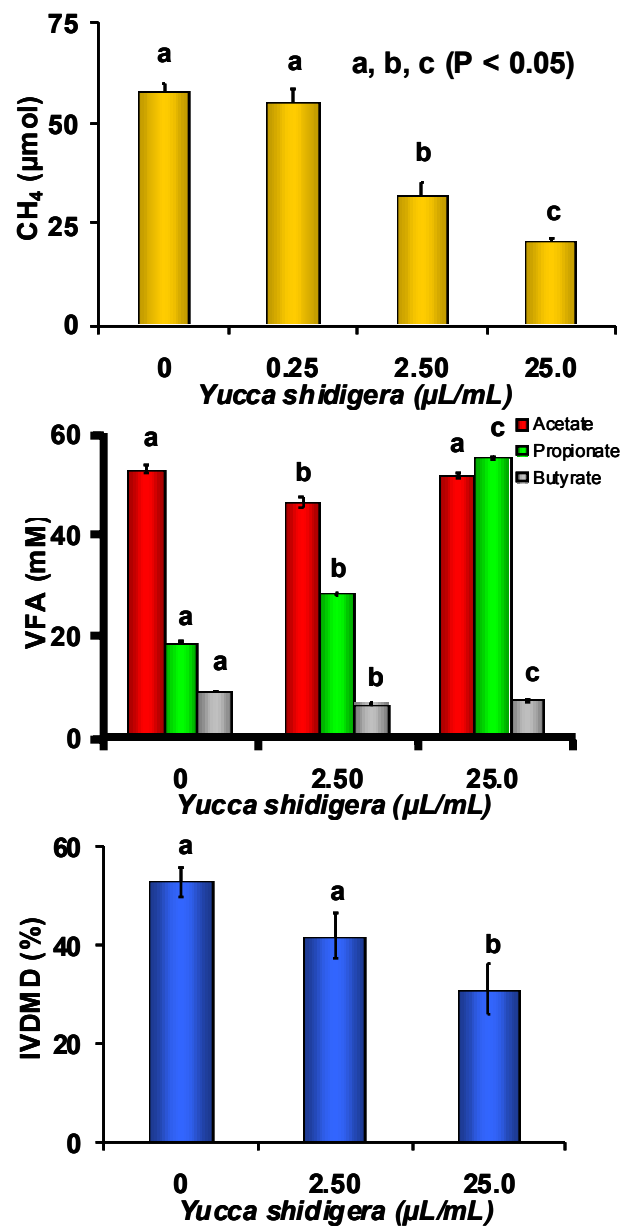
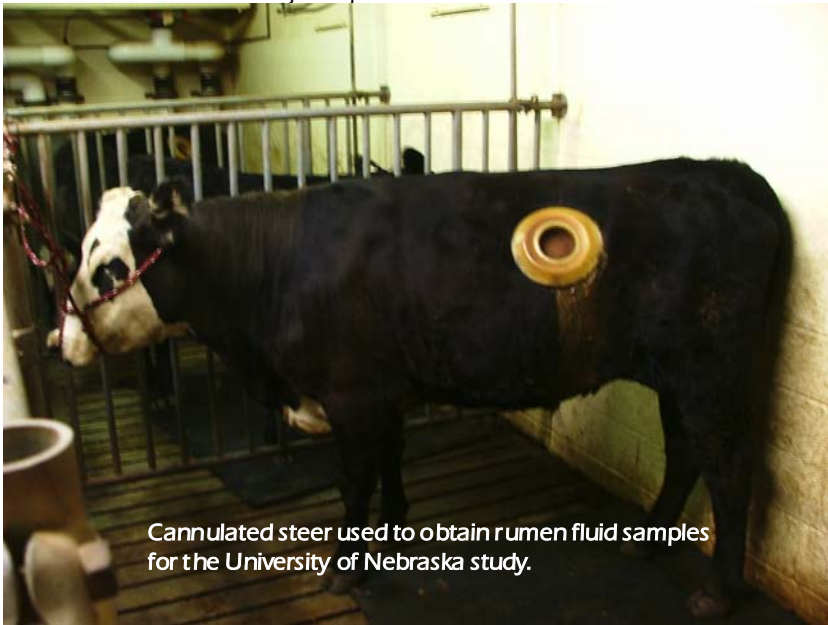
Grill over medium-high heat (350 - 400 degrees) for 8 - 10 minutes on each

side or to desired degree of doneness, brushing with reserved wine mixture

Mitigating ruminal methane production should divert reducing equivalent disposal toward the production of volatile fatty acids (VFAs), which are an important energy source for cattle. The main goal of Eric's work was to determine the effect of *Yucca schidigera* extract on the production of methane and volatile fatty acid production in cultures inoculated with ruminal fluid. Furthermore, the concentration of VFAs in the culture fluid was determined along with the amount of substrate (ground alfalfa) that was degraded during the incubation to give an estimate of in vitro dry matter disappearance (IVDMD). In summary, the study showed that *Yucca schidigera* extract had no effect on methane production at a concentration of 0.25

**POSTER ON METHANE REDUCTION**

μL/mL but decreased (P < 0.05) methane production by 45%, and 64% at 2.50 and 25.0 μL/mL, respectively. Extract at 2.50 μL/mL increased (P < 0.05) the concentration of propionate 50% and at 25.0 μL/mL it increased propionate by 200%. IVDMD was not affected by a 2.50 μL/mL concentration of extract. However, 25.0 μL/mL reduced (P < 0.05) IVDMD to one half of the control. Further studies will look at the effects of *Yucca schidigera* extract components (such as purified saponins) as well as attempt to look at the effects in an in-vivo trial using sheep as a model ruminant.



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## SARTEC EMPLOYEE HIGHLIGHT: TRAVIS HALLSTED

This issue's employee highlight is Travis Hallsted. Travis was born in the Sandhills of Nebraska at Atkinson and has lived in different parts of Nebraska his entire life. He currently resides in rural Wisner. In Travis's words, "I have been in the beef industry my whole life." His father is a retired Brand Inspector for the State of Nebraska. His father involved him in calls to cow/calf operations, feedyards, and sale barns while he was growing up. He graduated from Holdrege High School and has an Associates Degree in Feedlot Management Technology and an Associates Degree in Business Management from the University of Nebraska at Curtis.

Travis worked in the feedyard industry for 10 years involved in a variety of aspects of the feedlot business. Travis has walked in his customer's shoes and understands the industry because of his experiences as a cowboy and a manager. Travis and his wife are partners in a 3,000 head family owned feedyard. This experience helps him to

relate to his customers and communicate with all of the Feedyard personnel effectively. In his free time Travis enjoys spending time with family and caring for his longhorn cowherd. Also, his favorite pastime and real passion is hunting. Travis comments that, "I hunt for all species of game when they are in season." Travis has a wife Heidi, and 2 children. His son, Austin is 11 years old and enjoys sports and hunting just like his dad. His baby daughter, Jaleigh was born on May 18th 2005.



When asked what he likes about working at SarTec, he says, "SarTec is a very rewarding company that supports hard work, family values and ethics. SarTec gives me a lot of support and there is great communication within the company." Thanks Travis, for making SarTec such a great place to work and for helping us continue to develop into such a strong customer-oriented company!

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