

## North Florida Research and Education Center Research Update

D. D. Henry, F. M. Ciriaco, C. A. Njombwa, M. M. Kohmann, V. R. G. Mercadante, M. Ruiz-Moreno, G. C. Lamb, and N. DiLorenzo<sup>1</sup>

<sup>1</sup>North Florida Research and Education Center, University of Florida, Marianna, FL

A study was conducted to test the effects of the natural biopolymer, chitosan, on *in vivo* methane emissions in beef cattle. A total of 24 crossbred heifers (554 ± 26 lb of BW) were used in a study replicated in two periods. Heifers received a high-concentrate (HC) or a low concentrate (LC) diet ad libitum and methane was measured using the SF<sub>6</sub> tracer technique. The addition of up to 1% of chitosan in the diet DM did not affect methane emissions or growth performance in heifers consuming either diet. Heifers consuming the LC diet gained 0.59 lb/d and produced 2.9 times more methane per day than those fed a HC diet (130 vs. 45 g of methane/d), which gained 1.79 lb/d. A second study was designed to quantify methane emissions by heifers grazing bahiagrass pastures during the summer under three stocking rates: 0.5, 1.0, and 1.5 animal units per acre. A total of 24 heifers were used in a study that measured methane emissions during three consecutive months in the summer of 2012. Results are currently being analyzed, but no differences appear to exist for methane production between stocking rates. A study was performed to determine the effects of indigestible markers (Cr<sub>2</sub>O<sub>3</sub> and TiO<sub>2</sub>) and fecal sample collection schedules (2 or 3 times per day) on apparent total tract digestibility of nutrients in 3 annual summer forages. Twelve Angus crossbred heifers were fed green-chopped Mulato II (hybrid *Brachiaria*), pearl millet, or sorghum Sudan in the University of Florida – Feed Efficiency Facility (UF-FEF). An analysis of indigestible neutral detergent fiber (iNDF) as an internal digestibility marker was also completed. No effect of forage or interactions between forage and markers was found. No difference was observed in nutrient digestibility between samples collected twice- or thrice-daily when using iNDF as a marker. We concluded that using iNDF as an internal digestibility marker with a twice-daily fecal sampling

schedule appears most suitable to evaluate nutrient digestibility in summer annual forages. A similar study was completed examining winter forages, where 12 Angus and Angus-crossbred heifers were fed ryegrass, a blend of ryegrass and triticale, or a blend of oat and ryegrass. No differences were found between markers or fecal sample collection schedules. It was concluded that collecting feces twice per day with either Cr<sub>2</sub>O<sub>3</sub> or TiO<sub>2</sub> as markers would be sufficient to determine digestibility of winter annual forages. Further investigation into using iNDF as a marker for winter annual forages is a future endeavor of this lab. Research on heifer development and its relationship with feed efficiency is currently under way. For the past 2 years, replacement heifers from the NFREC herd (approximately 80 per year) have been developed in the UF-FEF measuring individual intake. Our current interest is the use of byproducts (peanut hulls, corn gluten feed and soybean hulls) to achieve the desired ADG. The overall goal is to obtain feed efficiency data on all females of the NFREC herd, which will greatly enhance our future research on feed efficiency at the herd-level.