

# Research Roundup

## Mix of organic, inorganic selenium may increase beef cow fertility.

by Aimee Nielson, University of Kentucky

Fertility is a driving factor for a sustainable and profitable cow-calf enterprise. Selenium (Se) plays a significant role in fertility, and in states like Kentucky and Tennessee, producers must supplement because their soil is selenium-deficient. In an ongoing study at the University of Kentucky (UK), researchers are pitting the industry-standard inorganic selenium against a 50:50 mix of inorganic and organic selenium to determine the most productive option.

“Selenium is an essential micronutrient that is incorporated into selenoproteins. These act as antioxidants, basically getting rid of free radicals, protecting the integrity of cells, which allow them to function better,” says Phillip Bridges, associate professor in the UK College of Agriculture, Food and Environment Department of Animal and Food Sciences.

“Animals can use organic or inorganic forms, but we typically supplement using an inorganic form,” Bridges notes. “With this work, we are finding that the

form of selenium supplemented can affect a variety of reproductive processes.”

### Research underway

For the study, Bridges supplemented sodium selenite as the inorganic form vs. a 50:50 mix of sodium selenite and a yeast-derived organic form. The researchers found that animals receiving the mixed form had increased progesterone levels by Day 6 and Day 7 of the estrous cycle, and then throughout pregnancy.

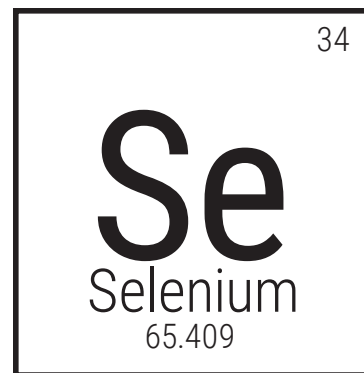
Bridges says the early increase in progesterone is perhaps the most intriguing part of the study.

“We’ve known for decades that increased early luteal-phase progesterone stimulates uterine development, length of the conceptus and indicators of fertility,” Bridges says.

To start the study, animals received no selenium supplementation for 45 days. Bridges notes that the animals were not selenium-deficient after the 45 days, but levels did significantly decrease.

For the next 45 days, he supplied the industry-standard inorganic selenium. The next 90 days, cattle received either inorganic or a mix of inorganic and organic selenium before researchers bred the animals and examined blood and tissues for differences.

Bridges says that by Day 17 after breeding, he noticed an altered abundance of progesterone and interferon-tau-



induced gene transcripts in the endometrium and an overall increase in conceptus length. He says scientists believe larger conceptuses may help ensure continued establishment and progression of a pregnancy.

Although the work is ongoing, Bridges believes using the 50:50 blend of organic and inorganic selenium will improve fertility at the production level. The grant-funded work will continue through early 2024.

“If you’re in an area where you have to supplement selenium, it appears the mixed form should increase fertility,” he says. “If you’re in a state like Kentucky, Tennessee or other cow-calf states, this is a great benefit to those beef cattle producers in terms of sustainability and profitability.” **ABB**

Editor’s note: Aimee Nielson is an ag communications specialist for the University of Kentucky. This material is based upon work supported by the National Institute of Food and Agriculture (NIFA), USDA. Any opinions, findings, conclusions or recommendations expressed are those of the author(s) and do not necessarily reflect the view of the Department of Agriculture.