

UDDER HEALTH/MILK QUALITY

J-5 Vaccine for Prevention of Coliform Mastitis: Part 2.

Frequently asked questions about the use of J-5 coliform mastitis vaccines.

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Will the use of a J-5 vaccine eliminate clinical coliform mastitis from my dairy herd?

The answer is no. The antibodies to the common core antigens will not completely prevent the growth of coliform bacteria in the mammary gland. However, the effect of J-5 vaccination is to reduce the number of fully mature endotoxin-producing coliform bacteria, which in turn will reduce the severity of the clinical case. Therefore the expected results from a J-5 vaccination program are a) reduction, not elimination, in the number of clinical coliform mastitis cases; and b) reduction in the severity of clinical mastitis. In fact, herds using J-5 very frequently report the near elimination of severe coliform cases.

What are some problems seen with the J-5 vaccines?

Local reactions. The injections are given subcutaneously and a local reaction to the carrier solution is a common finding, leaving a 2-inch firm nodule that remains for several months. Short duration of immunity induced by the J-5 vaccine. As a result, cows must be given multiple vaccinations each year. The UC Davis researchers achieved their success by vaccinating cattle at dry-off, again half-way through the dry period, and a third time shortly after calving. This schedule stimulates the production of high levels of antibody in the post-partum period, which is the time in which cattle are the most susceptible to coliform mastitis. Other vaccination schedules have been proposed to address variations in management schemes and clinical mastitis incidence. For instance, some herds find that the standard schedule reduces mastitis in the early postpartum period, but there is an apparent increase in mastitis 3-4 months later. The sudden "break" of mastitis may be due to the decline of J-5 immunity, and a booster dose may be helpful if given to cows 2-3 weeks before they would be expected to develop mastitis.

Adverse effects if given during lactation. There are anecdotal reports that if the J-5 products are given to cows during lactation, their somatic cell counts will increase; milk production will drop; and occasional abortions will occur. Field research has failed to document the increase in somatic cell counts or abortion rates. However, a recent article reported that a slight but significant (7%) drop in milk production occurred on days 2 and 3 after vaccination with the Sanofi J-5 Vac product. In summary, the only documented adverse effect of vaccination of cattle during lactation may be a mild transient reduction in milk production.

Which J-5 product should I use?

In the previous article, I mentioned that there are three similar products that are commercially available as vaccines against coliform infections. There are no head-to-head comparative studies of the efficacy of the three products, but it is clear that all three products are likely to induce immunity to the core antigens common to all coliform bacteria.

What is the ideal vaccination schedule?

Each of the three core-antigen vaccines has different recommendations as far as the schedule of administration is concerned. I recommend as a starting point that whatever product is chosen, a three-dose regimen is adopted: the first dose at dry-off, the second 4-6 weeks later, and the third soon after calving.

Modifications of this schedule have been proposed to address specific herd situations. The 3-dose schedule was designed by the UC Davis researchers in recognition of the usual finding that cows in early lactation have the highest incidence of coliform mastitis. Some herds have found that coliform mastitis throughout lactation. This situation is addressed by administration of vaccine at three month intervals throughout lactation. Another common finding in vaccinated herds is an "outbreak" of mastitis in mid-lactation, presumably when the immununity induced by the dry-cow vaccination has waned. A 4th dose of vaccine a week or so in advance of this mid-lactation outbreak may be indicated.

Should all herds vaccinate for coliform mastitis using a J-5 vaccine?

Herds without clinical mastitis due to coliform bacteria will not benefit from vaccination with a J-5 product. However, there are very few herds so fortunate! A partial budget analysis of the use of a J-5 vaccine program was performed by veterinarians at North Carolina State University. For an average US dairy farm with 20% of cow lactations affected by clinical coliform mastitis, the researchers calculated that the vaccination program would generate an additional \$57 of profit per cow lactation. They found that the financial breakeven point for the J-5 program occurred at an incidence of <1% of cow lactations.

Should I vaccinate my replacement springing heifers with a J-5 vaccine?

Coliform mastitis is much less common in first-lactation heifers. In general it is not considered cost-effective to use the vaccine in these animals.