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Efficacy of a New Navel Dip to Prevent Umbilical Infection in Dairy Calves

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Introduction

A field study, controlled at the farm level, was conducted utilizing 495 newborn calves in 13 commercial Wisconsin dairy herds to evaluate the use of a new umbilical disinfectant dip (Navel Guard (NG) Sirius Chemical Group, McDonough, GA) to prevent umbilical infections (omphalitis) as compared to 1) not dipping the umbilicus at birth, 2) dipping the umbilicus with 7% tincture of iodine, or 3) dipping the umbilicus with solutions containing a lower concentration (0.5 to 2%) iodine.

Materials and Methods

The control on each farm was the navel treatment applied to newborn calves on that farm prior to starting the study. Two farms were not dipping navels (ND), seven farms were dipping with 7% tincture of iodine (7TI), and four farms were dipping with a lower concentration of iodine (LI). The owner/manager of each farm agreed to alternate navel treatment (Navel Guard or control) on every other calf born, ear tag the calf, and record each calf's treatment. Only calves that would be available for three weeks for evaluation were enrolled in the study.

Navels were dipped as soon as the calf was discovered after birth. Except for non-dipped navels, long navel cords were trimmed to about 1 1/2 inches in length and then immersed in 15 ml of dip in a non-return type teat dipper and swirled vigorously.

Each farm was visited once a week on the same day of the week and the umbilical stalk (the subcutaneous portion of the navel cord exterior to the abdominal wall) was palpated for omphalitis for three weekly evaluations. Any calf that showed a pain response (flinch subsequent to a firm squeeze of the stalk) was considered infected. The stalk was rolled between the thumb and first two fingers of one hand and the diameter of the stalk was compared to different size wooden dowels in the other hand. The umbilicus was considered infected if it met any of the following size criteria: 1) the stalk did not atrophy and was still 8/16ths of an inch or larger on the third evaluation, 2) the stalk did atrophy but was still 10/16ths of an inch or larger on the third evaluation, or 3) the diameter of the stalk increased in size as compared to a prior evaluation of <8/16ths of an inch.

Data collected during farm visits was analyzed using SAS (version 9.2: SAS Institute, Cary, NC). The data was stratified by trial and analyzed in three separate analyses (i.e.NG versus ND, NG versus 7TI, and NG versus LI. Final significance was declared at $P < 0.05$.

Results

On the two farms not previously dipping navels, 10.3% (6 of 58) calves dipped with NG developed omphalitis compared to an infection rate of 28.3% (15 of 53) of the NT calves. The odds of developing an umbilical infection were estimated to be 3.48 (95% CL: 1.23, 9.86) in calves for which the umbilicus was not dipped as compared to calves dipped with NG (P=0.014)

On the seven farms previously using 7% tincture of iodine, 10.9% (16 of 147) calves dipped with NG developed omphalitis compared to an infection rate of 16.4% (24 of 146) of the 7TI calves. Despite the numeric differences, the odds of developing an umbilical infection were not different for calves enrolled in the NG group (O.R. = 1.69 (0.83, 3.41)) as compared to calves enrolled in the 7TI group (P=0.14).

On the four farms previously using 0.5 to 2.0% iodine solutions, 6.0% (3 of 50) calves dipped with NG developed omphalitis compared to an infection rate of 14.6% (6 of 41) of the LI calves. Despite the numeric differences, the odds of developing an umbilical infection were not different for calves enrolled in the NG group (O. R. = 2.88 (0.60, 13.78)) as compared to calves enrolled in the LI group (P=0.17).

Significance

This is the first controlled study to demonstrate the effectiveness of a navel dip, in this case Navel Guard, in decreasing the incidence of omphalitis in new born dairy calves, as compared to not dipping navels. There was also a numeric advantage, but no statistical advantage, when comparing the effectiveness of Navel Guard to other common navel dips, in this case 7% tincture of iodine and 0.5 to 2% iodine solutions, in decreasing the incidence of omphalitis in new born dairy calves.